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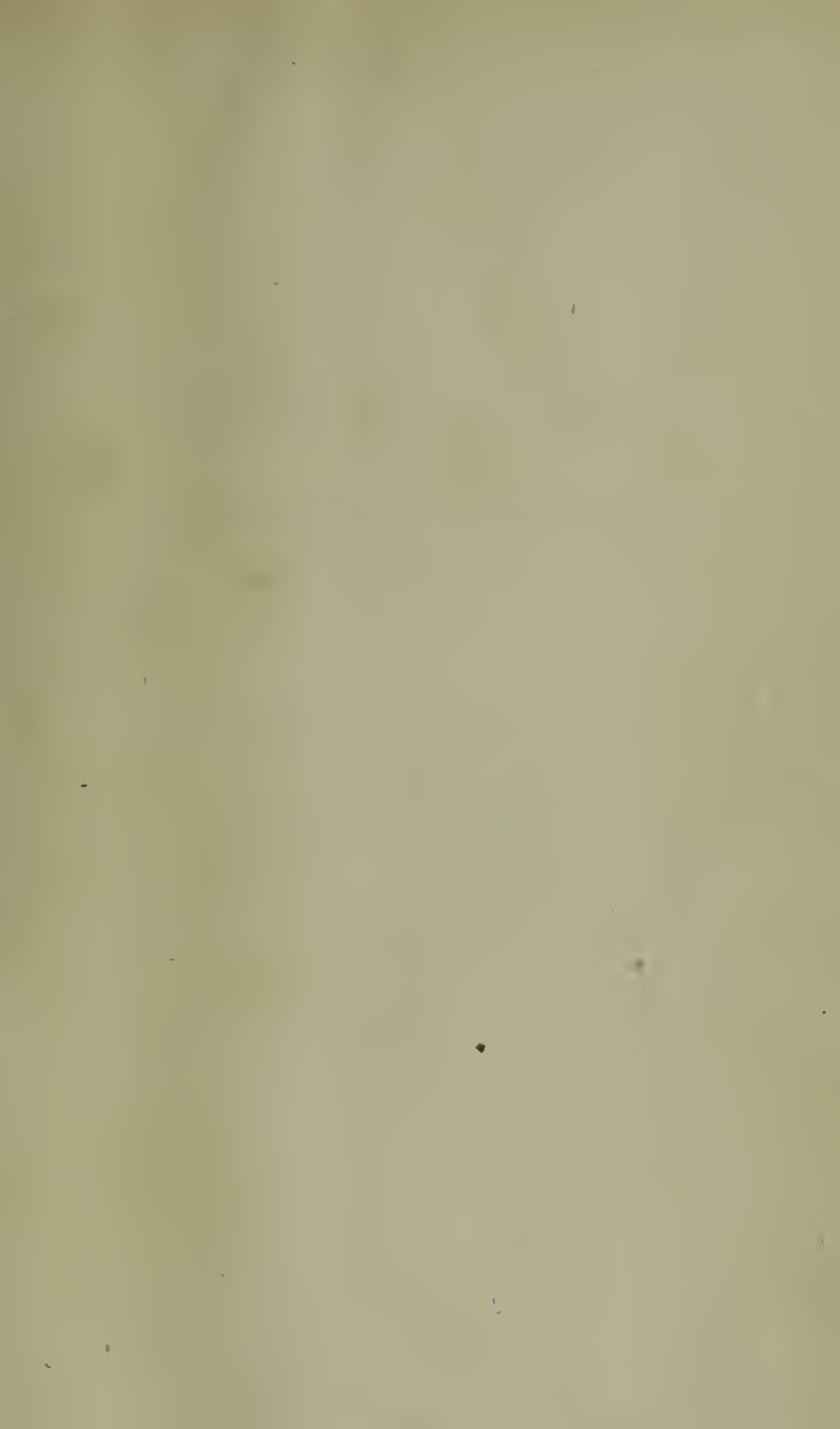
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Von. 1



THE
GARDENS AND MENAGERIE

OF THE
ZOOLOGICAL SOCIETY
DELINEATED;

BEING
DESCRIPTIONS AND FIGURES

IN ILLUSTRATION OF THE
NATURAL HISTORY

OF THE
LIVING ANIMALS IN THE SOCIETY'S COLLECTION.

THE DRAWINGS BY WILLIAM HARVEY;
ENGRAVED BY BRANSTON AND WRIGHT,
ASSISTED BY OTHER ARTISTS.

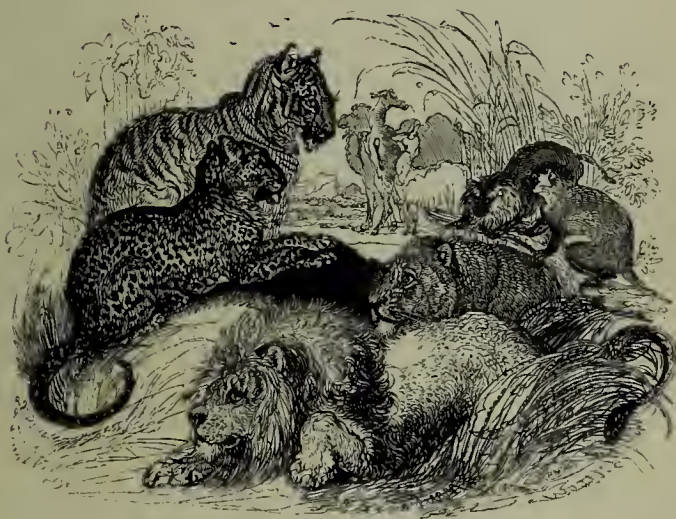
THE
GARDENS AND MENAGERIE

OF THE
Zoological Society
DELINEATED.

PUBLISHED, WITH THE SANCTION OF THE COUNCIL,
UNDER THE SUPERINTENDENCE OF THE
SECRETARY AND VICE-SECRETARY OF THE SOCIETY.

QUADRUPEDS.

VOL. I.



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PREFACE.

THE establishment of the Zoological Society forms an era in the history of the science in England as regards the higher departments of animated nature. In its Gardens and Museum our countrymen in general, whether previously attached to Zoology or indifferent to its allurements, have found incitement as well as opportunity to make themselves familiarly acquainted with the appearance and manners of a large proportion of the animal creation. To the most extensive assemblage of living Quadrupeds and Birds ever exhibited in this, or perhaps in any other, country, has been added the attraction of a delightful promenade; and fashion has combined with other and more legitimate stimulants to render the Menagerie as popular as it is instructive. The Museum too has had its full share in promoting the objects for which the Society was instituted, by affording to individuals of more expanded views the means of enlarging their knowledge of nature through a closer examination of her works.

It cannot be a matter of surprise that under such circumstances there should have arisen in the public mind a taste for zoological pursuits, and a desire for correct zoological information. To promote that taste and to gratify that wholesome desire are the objects of the present publication. One great aim of the Society is to diffuse as widely as possible a practical acquaintance with living animals, in order to eradicate those vulgar prejudices which have in too many instances usurped the place of truth, and to substitute just ideas, drawn from actual observation, instead of false deductions from distorted facts, or wild speculations built upon erroneous foundations. By the same views has the Editor of the following pages been guided. Popular works on Zoology have too long been left to the mercy of writers little if at all conversant with the science of which they professed to treat; and the natural consequence has been the growth and repetition of errors of the grossest kind. But the altered temper of the times, connected with the extensive support given to a popular Society for the cultivation of Zoology, appeared to afford a peculiarly favourable opportunity for attempting to counteract this baneful practice, and the Editor felt himself in some degree called upon by the office which he held to undertake the task.

The first requisite for the attainment of the end proposed was obviously an extensive circulation ; and this could only be secured by the use of the common forms of our language, in place of those technical expressions which render most scientific works unintelligible to the general reader. Such expressions the Editor has studiously endeavoured to avoid ; and in the few instances in which he has been compelled, for the sake of perspicuity, to have recourse to them, he has either added an explanation of their meaning, or so modelled the context as to render explanation unnecessary to any person of even moderate education. By thus addressing his language to the world at large, instead of confining it by the use of technicalities to the limited circle of professed zoologists, he trusts that he has to a certain extent enlarged the boundaries of the science without detracting from its real importance ; for it has been his endeavour throughout the work to employ English terms as definite in their meaning and as precise in their limitation as those which are usually considered exclusively zoological.

With this intelligible language it was necessary to combine a scrupulous accuracy in regard to facts. For this purpose the drawings of all the animals have been made from individual specimens in the Society's Menagerie ; and the descriptions

have been in every instance taken from the same individuals or carefully collated with them. It has sometimes happened that the Editor has been unable himself to verify, on the preserved animal or its parts, those particulars which it is frequently difficult or even impossible to ascertain in the living state; but in such cases he has generally quoted his authorities, and the responsibility in consequence rests with them alone. In the great majority of instances, however, he takes the responsibility wholly upon himself.

But the case is altogether different as regards the habits of the animals in their native state. For these he has almost always been compelled to rely on the statements of other writers, principally travellers, and rarely versed even in the elements of natural science. In referring to such authorities he has thought it right to exercise a salutary caution, rejecting without hesitation those relations which bordered too closely on the marvellous, or were evidently at variance with the organic structure of the animals. By this latter test he has uniformly tried them, and where he has found the imputed habits to correspond with the organization he has adopted the statement as probable, even if not altogether proved. There are, however, some observers of a higher order, on whose accounts he relies with implicit confidence, and

whose names will be found repeatedly quoted throughout the work. He will only add that in this, as well as in the descriptive department, he has had recourse, wherever it was possible, to original, and frequently to little known, works; and has very rarely indeed been guilty of a second-hand quotation.

A few words may be necessary as to the arrangement, or rather the want of arrangement, in the body of the work. From the very nature of the collection which he had undertaken to illustrate, the Editor found it impossible to dispose his subjects in systematic order, without omitting in their proper places many of those valuable acquisitions which were continually pouring in to the Menagerie. For this reason it was at length determined to take them promiscuously, separating only the Birds from the Quadrupeds; and to give at the close of each volume a systematic index of its contents. The Editor hoped too that before the conclusion of a volume he should be enabled to arrange the Quadrupeds in a series more strictly consonant with their natural affinities than any that has hitherto been proposed. But his own views upon the subject are not sufficiently matured for publication; and those of his friend MR. VIGORS, which the zoological world are anxiously expecting, have not yet appeared. He

has therefore thought it advisable, under these circumstances, to adopt in the Systematic Index the arrangement of M. Cuvier, the more especially as the mere list of the sixty or seventy Quadrupeds contained in this volume would offer a very imperfect and unsatisfactory idea of the details of a novel classification.

The Editor has only, in conclusion, to offer his best acknowledgments to the kind friend above named for his general revision of the work, and for numerous valuable suggestions. To Mr. Broderip he is also indebted for the communication of much interesting information ; as well as to Dr. Wallich, Mr. Yarrell, and other valued friends, who have kindly assisted him in his task. Nor can he suffer the opportunity to pass of offering his thanks to Mr. Harvey for the patient attention with which he has watched the manners of the animals for the purpose of investing their portraits with that natural expression in which zoological drawings are too often deficient ; and to Messrs. Branston and Wright for the pains which they also have taken in making themselves masters of the subjects previously to the execution of the Cuts.

E. T. BENNETT.

LONDON, JUNE 30, 1830.

CONTENTS.

	PAGE
CHINCHILLA	1
RATEL	13
WANDEROO MONKEY	21
HARE-INDIAN DOG	25
ESQUIMAUX DOG	27
BARBARY MOUSE	29
DIANA MONKEY	33
MONA MONKEY	37
NAPU MUSK-DEER	41
PALM SQUIRREL	47
AUSTRALIAN DOG	51
COLLARED PECCARY	55
WHITE-LIPPED PECCARY	61
INDIAN OX	65
ZEBU	69
SQUIRREL PETAURUS	71
WHITE-EYELID MONKEY	77
COLLARED WHITE-EYELID MONKEY	79
ENTELLUS MONKEY	81
LEOPARD	87
JAGUAR	95
BROWN BEAR	99
AMERICAN BLACK BEAR	107
CUBAN MASTIFF	111
AMERICAN BISON	113
INDIAN ANTELOPE	117
NYL-GHAU	125
POLAR BEAR	129
RED MONKEY	135
LESSER WHITE-NOSED MONKEY	137

	PAGE
SLOW-PACED LEMUR	139
RED LEMUR	145
THIBET DOG	149
BEAVER	153
CRESTED PORCUPINE	171
FASCICULATED PORCUPINE	175
MALABAR SQUIRREL	179
GRAY SQUIRREL	183
LESSER AMERICAN FLYING SQUIRREL	185
BLACK APE	189
BARBARY APE	191
AMERICAN TAPIR	193
VIRGINIAN FALLOW DEER	205
EUROPEAN FOX	211
RED FOX	217
CROSS FOX	221
SILVER FOX	223
WHITE-CHEEKED MARTEN	225
PINE MARTEN	229
REIN-DEER	241
AXIS DEER	253
ITALIAN WOLF-DOG	257
PARNASSIAN SHEEP	259
FOUR-HORNED SHEEP	263
VIRGINIAN OPOSSUM	265
CRAB-EATING OPOSSUM	271
BROWN LLAMA	273
WHITE LLAMA	283
BROWN PACA	287
LONG-NOSED AGOUTI	293
AMERICAN BLACK SQUIRREL	297
WHITE-FRONTED LEMUR	299
BLACK-FRONTED LEMUR	301
GREEN MONKEY	303
SYSTEMATIC INDEX	305



THE CHINCHILLA.

CHINCHILLA LANIGERA.

THE peculiar softness and beauty of the fur of the Chinchilla have been so long, so ornamentally, and so comfortably known to our fair countrywomen, that it would be paying their taste and curiosity a sorry compliment to imagine that they have no desire to become acquainted with the animal by which it is furnished. We are happy therefore to have it in our power to gratify them, as well as the scientific zoologist, by a figure and description of so interesting a creature, the former the only one that has yet been given to the world, and the latter the first that has appeared in our language.

Notwithstanding the extensive trade carried on in its skins, the Chinchilla might have been regarded until the last year almost as an unknown animal : for no modern

naturalist, with the exception of the Abbé Molina, a native of Chili, who has written expressly on the Natural History of that country, had seen an entire specimen, living or dead ; and the description given in his work added little of truth and much of error to the information that was to be derived from an inspection of the skins themselves in the imperfect state in which they are sent into the market. Still his account contains many particulars relative to the habits of the animal, which are not to be met with elsewhere, and we shall therefore extract it entire ; first, however, referring to such scanty notices in the works of former writers as appear to have been founded on original observation.

The earliest account of the Chinchilla with which we have met is contained in Father Joseph Acosta's Natural and Moral History of the East and West Indies, published at Barcelona, in Spanish, in the year 1591. From an English translation of this work, printed at London in 1604, we extract the following sentence, which is all that relates to the animal in question. "The Chinchilles is an other kind of small beasts, like squirrels, they have a woonderfull smoothe and soft skinne, which they weare as a healthfull thinge to comfort the stomacke, and those parts that have neede of a moderate heate;" [as most "beasts" do ; but the concluding part of the extract shows that this is spoken of the human natives, and not of the poor Chinchillas themselves ;] "they make coverings and rugges of the haire of these Chinchilles, which are found on the Sierre of Peru."

We find these animals again mentioned, and nearly to the same purpose, in "The Observations of Sir Richard Hawkins, Knight, in his Voyage into the South Sea, An. Dom. 1593," published at London in

a small folio, in the year 1622, and reprinted, three years afterwards, in the fourth part of "Purchas his Pilgrims." This hardy and adventurous seaman appears, notwithstanding the somewhat contemptuous manner in which he speaks of the "princes and nobles" that "laie waite" for these skins, to have been much of the same opinion with regard to their superior quality and comfort. It is worthy of remark that he treats them not as wool, in which light Acosta seems to have regarded them, but as fur. "Amongst others," he says, (showing, by the by, as little respect for the niceties of grammar as the translator above quoted), "they have little beastes, like unto a squirrell, but that hee is grey, his skinne is the most delicate soft and curious furre that I have seene, and of much estimation, (as is reason,) in the Peru; few of them come into Spaine, because difficult to be come by, for that the princes and nobles laie waite for them, they call this beast Chinchilla, and of them they have great abundance."

In the foregoing quotations the Chinchilla is only said to be like a Squirrel: later writers appear to have confounded them. Thus when Alonso de Ovalle, another Spaniard, whose "Historical Relation of the Kingdom of Chili" was published at Rome in 1646, says that "the Squirrels [Ardas] which are found only in the Valley of Guasco, are ash-coloured, and their skins are in great esteem for the fineness and softness of the fur," he evidently means the Chinchilla; for no species of Squirrel, whose fur is of any value, is found in that country. The same may also be said of an anonymous Italian author, (considered by some bibliographers, but we believe erroneously, to have been the Abbé Vidaure), who published at Bologna in 1776 a Compendium of the Geographical, Natural, and Civil

History of the Kingdom of Chili. This writer speaks of the Arda, which is the Spanish word for a Squirrel, as a species of Rat or Campagnol, of the size of a Cat, found only in the province of Copiapo, moderately docile, and covered with ash-coloured wool, as close and delicate as the finest cotton.

But this confusion of species becomes tolerable if compared with another into which the same author has fallen when he speaks of the Chinche, the most insupportably offensive of all stinking animals, as having a remarkably soft fur, which is made into coverlets for beds. The responsibility, however, for the latter error must rest with Buffon; who, after quoting Feuillee's excellent description of that abominable beast, adds: "it appears to me that the same animal is indicated by Acosta under the name of Chinchilla, which is not very different from that of Chinche." How this great naturalist could have been led to confound two animals so essentially distinct in every particular, of one of which he had a specimen in good preservation, while the skins of the other, mutilated it is true, but still distinctly recognisable, might probably have been seen in the warehouse of every furrier, we are at a loss to conjecture. The circumstance itself affords a striking proof of the obscurity in which the history of the Chinchilla was then involved, when the mere similarity of sound in the names was the solitary argument advanced in favour of so unfortunate a conjecture. The error was corrected by D'Azara, who is, however, himself mistaken in regarding the Chinche of Feuillee and Buffon as his Yagouaré, and who adds nothing to what was already known with respect to the true Chinchilla.

Molina's Essay on the Natural History of Chili was originally published in Italian at Bologna in 1782. In

the preface the author candidly confesses that his materials are not sufficiently complete for a general Natural History of the country. They appear indeed to have consisted partly of the recollections of a vigorous mind, and partly of such imperfect notes as could only be made use of in the way of hints to recall to the memory some of those minor points which might otherwise have escaped it. It is obvious that under such circumstances, however careful the writer may have been to avoid mistakes, it is impossible to place in his descriptions that implicit confidence to which his acknowledged good faith would otherwise entitle him. In this work he describes the Chinchilla as a species of the Linnæan genus *Mus*, under the name of *Mus laniger*, by which appellation it was received into Gmelin's Edition of the *Systema Naturæ*, and continued to be known among naturalists, until M. Geoffroy-Saint-Hilaire suggested that it ought rather to be regarded as a species of the genus separated by him from the Rats under the name of *Hamster*. This opinion was immediately adopted by zoologists, and seems to have been taken up by Molina himself, in a second edition of his *Essay*, published in 1810, which contains some trifling additions to his former article on the Chinchilla. We proceed to translate from the latter those passages which relate to the subject.

"The Chinchilla," he says, "is another species of field-rat, in great estimation for the extreme fineness of its wool, if a rich fur as delicate as the silken webs of the garden spiders may be so termed. It is of an ash-grey, and sufficiently long for spinning. The little animal which produces it is six inches long from the nose to the root of the tail, with small pointed ears, a short muzzle, teeth like the house-rat, and a tail of moderate length, clothed with a delicate fur. It lives

in burrows underground in the open country of the northern provinces of Chili, and is very fond of being in company with others of its species. It feeds upon the roots of various bulbous plants which grow abundantly in those parts ; and produces twice a year five or six young ones. It is so docile and mild in temper that if taken into the hands it neither bites nor tries to escape ; but seems to take a pleasure in being caressed. If placed in the bosom it remains there as still and quiet as if it were in its own nest. This extraordinary placidity may possibly be rather due to its pusillanimity, which renders it extremely timid. As it is in itself peculiarly cleanly, there can be no fear of its soiling the clothes of those who handle it, or of its communicating any bad smell to them, for it is entirely free from that ill odour which characterizes the other species of Rats. For this reason it might well be kept in the houses with no annoyance and at a trifling expense, which would be abundantly repaid by the profits on its wool. The ancient Peruvians, who were far more industrious than the modern, made of this wool coverlets for beds and valuable stuffs.—There is found," he adds, "in the same northern provinces another little animal with fine wool called the Hardilla, which is variously described by those who have seen it ; but as I have never observed it myself, I cannot determine to what genus it belongs." There can be little doubt, we should imagine, that this animal is identical with the Chinchilla, the latter, as we have already seen, being frequently spoken of by the name of Arda, the same with Harda, of which Hardilla is only the diminutive.

We shall conclude our quotations of former notices with the following extract from Schmidtmeier's "Travels into Chile over the Andes," London, 4to., 1824 ;

which furnishes some particulars, apparently derived from the traveller's own observation, that had not been touched upon by previous writers. "The Chinchilla," he says, "is a woolly field-mouse, which lives underground, and chiefly feeds on wild onions. Its fine fur is well known in Europe; that which comes from Upper Peru is rougher and larger than the Chinchilla of Chile, but not always so beautiful in its colour. Great numbers of these animals are caught in the neighbourhood of Coquimbo and Copiapo, generally by boys with dogs, and sold to traders who bring them to Santiago and Valparayso, from whence they are exported. The Peruvian skins are either brought to Buenos-Ayres from the eastern parts of the Andes, or sent to Lima. The extensive use of this fur has lately occasioned a very considerable destruction of the animals."

Such is the history of our knowledge of this interesting animal until the arrival of a living specimen which was brought to England by the late expedition to the north-west coast of America, under the command of Captain Beechey, and by him presented to the Zoological Society. An entire skin, rendered particularly valuable in consequence of its having the skull preserved in it, was at the same time brought home by Mr. Collie, the surgeon of Captain Beechey's vessel, and deposited in the collection of the British Museum. We have thus fortunately placed within our reach the means of correcting many of the errors into which former writers have fallen with regard to it, and of giving a more complete description of it than has yet been laid before the world.

To begin with its generic characters. The slightest inspection of its teeth was sufficient to prove that it could no longer be associated with the groups in which

it had been previously placed ; and a closer examination served only to confirm the idea that it was equally distinct in character from every other known genus of Rodentia. In proof of the former part of this assertion we borrow from the Zoological Journal Mr. Yarrell's description of these organs, taken from the specimen before-mentioned, with one indispensable alteration, of which that gentleman has himself since seen the necessity. He there describes the teeth as consisting of two incisors in each jaw, and of four molars on either side ; the three anterior of the upper jaw formed of two parallel bony portions with three alternating lines of enamel, and the fourth having an additional portion of bone and enamel, but smaller than the two principal ones. The direction of the parallel laminæ of these teeth is not at right angles with the line of the maxillary bone, but inclining obliquely from without backwards ; and the molars of the lower jaw are placed still more obliquely than those of the upper.

But the examination on which this statement was founded was made under circumstances of great disadvantage, inasmuch as it is almost impossible to obtain a distinct view of the teeth of any animal while the skull remains within the skin, from which it was of course not allowable in the present instance to remove it. The necessity for the alteration to which we have before alluded has been rendered obvious only since the skin was transferred to the British Museum, by the extraction from the lower jaw of the two anterior molars of the right side, which are now shown each to possess a smaller third lamina of bone, with its corresponding enamel, placed in front of, and not projecting so far externally as, the two remaining portions of the tooth. This third lamina is separated from that next to it by a deep groove on the inner side, but on the

outer there is no indication of such a division; the inner surface of each of these teeth consequently offers two such grooves, while the outer presents no more than one.

In the observations appended to his account of the teeth Mr. Yarrell appears to consider the Chinchilla as nearly allied to Mr. Brookes's new genus *Lagostomus*, of which a figure and description are contained in the last published part (the first of the sixteenth volume) of the *Linnean Transactions*; and the general resemblance of form, together with the characters of the teeth as given in that notice, unquestionably warrant at least a close approximation. But we apprehend that the alteration above made in the description of the teeth of the Chinchilla, together with the discrepancy in the number of the toes, which in our animal are four on the hind feet, while in *Lagostomus* they are but three, will be considered fully sufficient to establish a generic difference between them. The close affinity subsisting between these animals has been subsequently recognised by M. Cuvier from the very imperfect materials in his possession, consisting only of mutilated skins of the one and drawings and descriptions of the other. In the new edition, just published, of his *Règne Animal* he regards them both as decidedly forming part of the same genus; but does not venture, until he shall have seen their teeth, to determine their position in the series, which he considers so uncertain as to render it doubtful whether they approach most nearly to the Guinea-pigs, the *Lagomys*, or the Rats. In the removal of these doubts we are happy to assist by furnishing the proof that, although generically distinct, they both evidently belong to the same natural tribe, and contribute, along with *Lagomys* and *Pedetes*, to establish a connexion between the otherwise widely separated families of the Hares and the Jerboas.

The length of the body in our specimen is about nine inches, and that of the tail nearly five. Its proportions are close-set, and its limbs comparatively short, the posterior being considerably longer than the anterior. The fur is long, thick, close, woolly, somewhat crisped and entangled together, grayish or ash-coloured above, and paler beneath. The form of the head resembles that of the Rabbit; the eyes are full, large, and black; and the ears broad, naked, rounded at the tips, and nearly as long as the head. The moustaches are plentiful and very long, the longest being twice the length of the head, some of them black and others white. Four short toes, with a distinct rudiment of a thumb, terminate the anterior feet; and the posterior are furnished with the same number, three of them long, the middle more produced than the two lateral ones, and the fourth, external to the others, very short and placed far behind. On all these toes the claws are short, and nearly hidden by tufts of bristly hairs. The tail is about half the length of the body, of equal thickness throughout, and covered with long bushy hairs; it is usually kept turned up towards the back, but not reverted as in the Squirrels.

To the account of its habits given by Molina we can only add that it usually sits upon its haunches, and is even able to raise itself up and stand upon its hinder feet. It feeds in a sitting posture, grasping its food and conveying it to its mouth by means of its fore paws. In its temper it is generally mild and tractable, but it will not always suffer itself to be handled without resistance, and sometimes bites the hand which attempts to fondle it when not in a humour to be played with.

Although a native of the alpine valleys of Chili, and consequently subjected in its own country to the effects of a low temperature of the atmosphere, against which its thick coat affords an admirable protection, it was

thought necessary to keep it during the winter in a moderately warm room, and a piece of flannel was even introduced into its sleeping apartment for its greater comfort. But this indulgence was most pertinaciously rejected, and as often as the flannel was replaced, so often was it dragged by the little animal into the outer compartment of its cage, where it amused itself with pulling it about, rolling it up and shaking it with its feet and teeth. In other respects it exhibits but little playfulness, and gives few signs of activity; seldom disturbing its usual quietude by any sudden or extraordinary gambols, but occasionally displaying strong symptoms of alarm when startled by any unusual occurrence. It is, in fact, a remarkably tranquil and peaceable animal unless when its timidity gets the better of its gentleness.

A second individual of this interesting species has lately been added to the collection by the kindness of Lady Knighton, in whose possession it had remained for twelve months previously to her presenting it to the Society. This specimen is larger in size and rougher in its fur than the one above described; its colour is also less uniformly gray, deriving a somewhat mottled appearance from the numerous small blackish spots which are scattered over the back and sides. It is possible that this may be the Peruvian variety, mentioned in the extract from Schmidtmeier's Travels as furnishing a less delicate and valuable fur than the Chilian animal. It is equally good tempered and mild in its disposition; and, probably in consequence of having been domiciliated in a private house instead of having been exhibited in a public collection, is much more tame and playful. In its late abode it was frequently suffered to run about the room, when it would show off its agility by leaping to the height of the

table. Its food consisted principally of dry herbage, such as hay and clover, on which it appears to have thriven greatly. That of the Society's original specimen has hitherto been chiefly grain of various kinds, and succulent roots.

When the new comer was first introduced into Bruton Street, it was placed in the same cage with the other specimen; but the latter appeared by no means disposed to submit to the presence of the intruder. A ferocious kind of scuffling fight immediately ensued between them, and the latter would unquestionably have fallen a victim, had it not been rescued from its impending fate. Since that time they have inhabited separate cages, placed side by side; and although the open wires would admit of some little familiarity taking place between them, no advances have as yet been made on either side. Such an isolated fact can, of course, have little weight in opposition to the testimony of Molina that the Chinchilla is fond of company. It is nevertheless a remarkable circumstance, and deserves to be mentioned in illustration of the habits of these animals.





THE RATEL.

RATELUS MELLIVORUS.

THE dentition of the Ratel is so contradictory to the singular habits attributed to it by Sparrman and all subsequent travellers to the Cape of Good Hope, that we are compelled to doubt the perfect accuracy of the common report on which their statements appear to have been founded, or at least to admit that there is still much to be learned before its history can be regarded as complete. It requires indeed the most positive evidence to convince us that an animal, the number and disposition of whose teeth correspond more closely with those of the Cats than any other quadruped with which we are acquainted, and exhibit a carnivorous character scarcely, if at all, inferior to that which is evidenced by the same organs in the Hyænas, should subsist entirely, as from these accounts we are left to

believe, upon the petty rapine of a hive of bees and the honied produce of their comb. Still there exist such decisive marks of a diminished capacity for preying on animal food in the thick-set and clumsy form of its body, the shortness of its limbs, its partially plantigrade walk, the structure of its claws, the elongation of its muzzle, and even in the form of the teeth themselves, as to induce us to pause before we determine to reject the popular testimony as unworthy of credit, although we must regard it as doubtful on some particular points, and insufficient and imperfect on the whole.

The teeth of this curious animal, according to M. F. Cuvier's figures and description, confirmed by our own observations on two specimens preserved in the Society's Museum, and as far as possible on the living animal, consist of the six incisors common to nearly all carnivorous quadrupeds, two canines, and eight cheek-teeth in each jaw. The incisors have little to distinguish them from those of the neighbouring groups. The canines are remarkably thick and strong, especially in the lower jaw, and are somewhat triangular in their general outline. In the upper jaw the cheek-teeth are composed of two false molars with conical and pointed crowns, one lacerator, and one tubercular, arranged exactly in the same manner as in the Cats. The lacerator, however, presents a much greater extent of surface than in those animals, and the tubercular tooth placed within its posterior angle expands into a flattened crown of considerable size. In the lower jaw there are three false molars anterior to the broad and powerful lacerator, and no tubercular tooth behind it. These characters are so peculiar that it is no longer possible, with any regard to systematic consistency, to confound the animal to which they belong, either with the Civets,

with which it was associated by Sparrman, and after him by the generality of writers on zoology, or with the Gluttons, by the side of which Baron Cuvier has proposed to place it. It must of necessity form the type of a new genus, which may be further characterized by its thick, heavy, depressed body; its short stout legs, with five toes upon each foot, each of the toes surmounted by slightly arched unretractile claws, grooved along their under surface, and much longer on the anterior than on the posterior feet; its total want of external ears, their place being supplied by a slightly elevated margin surrounding an auditory opening of moderate size; the prolongation of its snout, which terminates in a soft and naked muzzle; and the roughness of its tongue, which resembles that of the Cats in the sharpness, elevation, and backward direction of its horny papillæ.

The Ratel was first clearly described by La Caille, in his Voyage to the Cape, under the misapplied designation of *Blaireau puant*. This unmerited epithet has in all probability given rise to the general opinion that it is also the animal referred to by Kolbe as the *Stinckbinksen* of the Dutch colonists; but there is scarcely any part of his account of that disgusting creature which fairly warrants the inference. It is far more likely that his beast was the *Zorille*, to which alone, of all the animals of Southern Africa, its manners bear a close resemblance. Our animal was afterwards described with tolerable accuracy by Sparrman under its *Hottentot* and colonial designation, which it has ever since retained. Gmelin, and Shaw adopting his error, have, however, contrived, with their usual carelessness of compilation, to subdivide these synonyms in such a manner as to form two distinct species of the Ratel alone; La Caille supplying them with their *Viverra*

Capensis, and Sparrman with their *Viverra mellivora*. These were very properly united by Pennant, who nevertheless appears to have had no personal knowledge of the Cape animal, for happening to meet with a living specimen from India in the possession of John Hunter, he treated it as entirely new and nondescript, and, totally unsuspecting of the existence of the slightest relation between it and the African quadruped, placed it in a distant part of the system and in a genus with which it has but little real affinity, under the name of the Indian Badger. This latter was adopted by Dr. Shaw in his General Zoology as the *Ursus Indicus*; but not without an indication of the intimate connexion subsisting between the three assumed species, which it was here tardily acknowledged might perhaps prove to be identical. That such is really the fact will, we think, be sufficiently obvious from the description of our specimens, compared with the accounts of former writers.

In size the Ratel is about equal to the Badger, to which it also bears a distant resemblance in form. The whole of the upper surface of its body, which is singularly broad and flat, comprehending the top of the head and neck, the entire plane of the back, and the root of the tail, is of a dull ash-gray, whiter towards the head, and strongly contrasting with the under parts, including also the muzzle, the contour of the eyes and of the ears, the limbs, and the remainder of the tail, which are throughout perfectly black. The only visible difference which we have been able to detect between the Asiatic and African animals consists in this, that the latter is described as possessing a stripe of lighter gray, about an inch in breadth, passing from behind the ears along each side, and forming the boundary of the two colours, which is entirely wanting in our specimen, and in the

figure of the Indian variety given by General Hardwicke.

The hair all over the body, although tolerably smooth, is remarkably stiff and wiry; and the hide beneath it is excessively tough, and so loose that Sparrman's statement is scarcely to be regarded as an exaggeration, when he assures us that if "any body catches hold of him by the hind part of his neck, he is able to turn round, as it were, in his skin, and bite the arm of the person that seizes him." The claws on the fore feet are extremely long, and although not very strongly curved, of considerable power, being formed especially for digging up the earth; an operation which all the accounts of the animal's manners concur in stating that it performs with great dexterity. Of these claws the middle three are much longer than the lateral, and the internal one is placed far behind the others. On the hind feet the claws, also five in number, are of nearly equal length, but are much shorter, and proportionally much less powerful, than those of the anterior members. The total length of the animal is about three feet, of which its tail forms little more than a sixth. Its height does not exceed ten or twelve inches, and the length of its fore claws, when not worn down by constant use, is about an inch and a half.

With respect to the habits of these animals we shall first give an abstract of Sparrman's version of the relations of the Hottentots and of the Dutch Colonists, which has been adopted by all subsequent writers. The bees, according to our author, furnish the Ratel with his principal, if not his only, means of subsistence. These insects are accustomed to take up their abode in holes in the earth formed by various burrowing quadrupeds; and the Ratel is endowed with peculiar sagacity for discovering their nests, which it undermines

with its powerful claws, in order to feast upon the honey contained in them. Aware that sun-set is the period at which the bees return to their homes, it chooses that time for making its observations, which are conducted in a very curious manner. Seated upon the ground with one of its paws raised so as to shade from its eyes the rays of the declining sun, it peers cautiously on either side of this singular kind of parasol, until it perceives a number of bees flying in the same direction. These it carefully marks, and follows in their track until it has safely lodged them in their nest, which it immediately commences pillaging. But if it should happen that, contrary to their usual custom, they have built in the hollow of a tree, the Ratel being unable to climb, and angry at its disappointment, wreaks its vengeance upon the senseless stock by biting around it; and the Hottentots know well that such marks on the trunk of a tree are certain indications of a bees' nest being contained within it.

It is added that the Ratel, as well as the native inhabitants of the neighbourhood of the Cape, is sometimes guided in this search after honey by a little bird, the *Cuculus Indicator*, or Honey-Cuckoo, which it seems has sagacity enough to know that both men and beasts are fond of the tempting spoil. This little creature, although incapable of storming a hive in its own person, takes advantage of the propensity which exists in others who are better fitted for the task, and invites the Hottentot or the Ratel to follow it by a peculiar note, which they both equally understand. Having thus secured their attention, it flies slowly on before them, alternately halting for them to come up with it, and then taking another flight, still admonishing them by its warning voice, until it arrives at the spot where the hidden treasure is deposited. There it suddenly

ceases to be heard ; but remains quietly perched on a tree in the vicinity, waiting for a share of the plunder which it usually receives as a reward for its interested service.

In such an attack upon an angry swarm the toughness of the Ratel's hide must be a most effectual defence ; and it is even stated that so difficult is it to penetrate its skin that a pack of dogs, which would be sufficient to dispatch a moderate sized lion, have sometimes failed in their attack upon so comparatively insignificant an animal. Such is its tenacity of life that Mr. Barrow states that "it is a species of amusement for the farmers to run knives through different parts of its body, without being able for a length of time to deprive it of existence." Major Denham was, however, informed by the natives of Central Africa, where it is also found, that a single blow on the nose is sufficient to destroy it almost instantaneously : which may probably be owing to the thinness of the skull adjoining the ossa nasi. In the same regions it has obtained credit for so much ferocity, as to be said, at certain seasons, to venture singly to attack a man.

Very different from Sparrman's account is that given by General Hardwicke, whose testimony is so fully confirmed by the structure of the animal that its authenticity may be considered as beyond a doubt. The General states that it is found in several parts of India, in the high banks bordering the Ganges and the Jumna, from which it rarely issues by day, but prowls at night around the habitations of the Mahomedan natives, scratching up the recently buried bodies of the dead, unless their graves are protected by thorny bushes placed over them for the purpose. It burrows with such celerity that it will work itself under cover in the hardest ground in the space of ten minutes. The

natives sometimes dig them out of their holes and take them alive; the old ones, however, are with difficulty secured, and seldom live long in captivity. The young, on the contrary, are very manageable, docile, and playful. Their general food is flesh in any state, but birds and living rats appear to be peculiarly acceptable. They are fond of climbing, but perform this operation in a clumsy manner; although they will ramble securely along every arm of a branching tree, provided it is sufficiently strong to bear their weight. They sleep much during the day, but become watchful at night, and manifest their uneasiness by a hoarse call or bark proceeding from their throat.

To the Indian variety, whose habits are thus described by General Hardwicke, our specimen unquestionably belongs, having been transmitted to this country from Madras, whither it was brought from the interior. It is probably the oldest inhabitant of the Garden, into which it was introduced at its first formation, after having remained for some months previous in Bruton Street. As far as its manners have yet been developed, it appears to be, with regard to man at least, one of the most playful and good tempered of beasts, soliciting the attention of almost every visiter by throwing its clumsy body into a variety of antic postures, and, when noticed, tumbling head over heels with every symptom of delight. But towards animals it exhibits no such mildness of temper: and it is curious to observe the cat-like eagerness with which it watches the motions of any of the smaller among them that happen to pass before its den, and the instinctive dread manifested by the latter on perceiving it. Its food is of a mixed nature, consisting, like that of the Bears and other less carnivorous beasts, of bread and milk in the morning, and flesh in the latter part of the day.



THE WANDEROO MONKEY.

MACACUS SILENUS. LACÉP.

“THERE are,” says Father Vincent Maria, Procurator-general of the Bare-footed Carmelites, with a gravity worthy of his order and of his office, “four sorts of Monkeys found on the coast of Malabar. The first is perfectly black, covered with glossy hair, with a white beard surrounding his chin and extending a span or more in length. To this Monkey all the rest pay such profound respect, that they submit and humiliate themselves in his presence, as though they were capable of appreciating his superiority and preeminence. The princes and great lords hold him in much estimation, because he is endowed above every other with gravity, capacity, and the appearance of wisdom. He is easily trained to the performance of a variety of ceremonies, grimaces, and affected courtesies, all which he accomplishes in so serious a manner and to such perfection,

that it is a most wonderful thing to see them acted with so much exactness by an irrational animal." Of the gravity, capacity, and wisdom of the wonderful creature thus celebrated, the visitors either of the Gardens, or of the Museum in Bruton Street, have now an opportunity of judging for themselves; but it is sadly to be feared that their estimate of its character will not exactly tally with that of the Reverend Father to whom we are indebted for this, the earliest incidental notice of its existence.

The pious missionary, whose account of his voyage to the East Indies was published at Rome in 1678, was followed by a plain English seaman, Robert Knox by name, who was detained a prisoner in the island of Ceylon for nearly twenty years, and who, on his return to his native land, in 1681, gave to the world his *Historical Relation* of that almost unknown region. He tells us that some of the Monkeys found there are "as large as our English Spaniel Dogs, of a darkish gray colour, and black faces, with great white beards round from ear to ear, which make them show just like old men:" and in somewhat of the likeness of old men he therefore figures them. "They do but little mischief," he adds, "keeping in the woods, eating only leaves and buds of trees; but when they are caught they will eat any thing. This sort they call in their language *Wanderows*." The descriptions given by both these authors, although very concise, agree so well with the actual characters of the Monkey to which Buffon has applied the same appellation, under the French disguise of *Ouanderou*, that there can be no doubt of their relating to the same animal. But this can hardly be said of that given by an anonymous traveller, who published, in 1701, an *Historical Description* of the Kingdom of Macassar; and whose account of some of the Monkeys of that country has generally been referred

to the present species. These he distinguished from the rest as being white, whereas our animals are black ; and as being “ sometimes as big and as mischievous as an English mastiff,” a size which those before us in all probability never attain. The uncourteous behaviour towards the Macassar ladies which he imputes to them must therefore be erased from the catalogue of enormities justly chargeable upon the species which inhabits the Malabar Coast and the island of Ceylon.

The Wanderoos belong to that group of the Monkey tribes of the Old World which has received its name from the Macaque, as being probably the most common of all the species that compose it. This group or genus is distinguished by a blunt and elongated muzzle, forming a facial angle of from 40° to 45° ; by the prominence of the superciliary crests, which overhang the eyes and give a peculiar expression to the physiognomy ; by the retrocession of the forehead above ; and by the comparative shortness of the tail, which is rarely equal in length to the body, but is in some species nearly reduced to the dwarfishness of a pig-tail, and in one or two others is nothing more than a mere tubercle. In their manners there is considerable variety, dependent in a great degree upon their age, and the society to which they have been accustomed.

The present species, the Lion-tailed Monkey of Penant, cannot possibly be confounded with any other. Its hair is of a deep black throughout, with the exception of the long beard, or mane as it has been sometimes called, which descends on each side of the face in the form of a ruff, extending downwards over the chest, and varying from an ash-gray to a pure white. The upper part of its face between the eyes is naked and flesh coloured ; the muzzle perfectly black. It has large cheek-pouches, and flesh-coloured callosities of considerable size. The tail is about half as long as

the body, and when perfect, which in captivity is not often the case, terminates in a brush of tufted hairs.

The Society has at present two specimens of this Monkey. That which has remained for some months in Bruton Street is an extremely active and occasionally very troublesome, but at the same time a perfectly good tempered, fellow. His favourite exercise appears to consist in throwing himself together with his chain over the transverse bar which passes from pole to pole, and swinging himself backwards and forwards while thus suspended by his loins. When a party enters the room he usually descends his pole with rapidity, and watches a favourable opportunity for jumping upon some of them unawares and carrying off a hat or whatever else he may happen to seize, with which he instantly reascends his pole, and seats himself at the top, enjoying the success of his scheme. He is very strong, and were his teeth fully grown would in all probability prove a dangerous animal; but he is still too young to be seriously mischievous. The individual at the Garden is a new comer, and is at present too closely confined to enable us to judge well of his disposition and manners.





THE HARE-INDIAN DOG.

CANIS FAMILIARIS. Var. LAGOPUS.

THE Mackenzie River, or, as Dr. Richardson has preferred naming it, the Hare-Indian Dog, is of small size and slender make. Its muzzle is narrow, elongated, and pointed; its ears broad at the base, pointed at the tip, and perfectly erect; its legs rather long and delicate; and its tail thick, bushy, and curved slightly upwards, but not by any means with the decided curl of the Esquimaux. Its body is covered with long straight hairs, the ground-colour of which is white, marked with large irregular patches of grayish black intermingled with various shades of brown. The ears are covered on the outside with short brown hair, which becomes blackish towards the margin and at the base; that of the inside is longer and white. On the muzzle the hair is white and very short, as also on the legs; but becomes thicker and somewhat longer on the feet, and is continued to the very extremities of the toes.

Dr. Richardson suspects that this variety of the

Dog "was perhaps formerly generally spread over the northern parts of America; but being fitted only for the chase, it has, since the introduction of guns, gradually given way to the mongrel race sprung from the Esquimaux, Newfoundland, and this very breed, with occasional intermixture of European kinds." It seems at present to be peculiar to the Hare-Indians and other tribes frequenting the banks of the Mackenzie River and Great Bear Lake, in the neighbourhood of which our enterprising countrymen, Captain Sir John Franklin and Dr. Richardson, wintered with their party, previously to setting forth on their late hazardous but eminently successful expedition to explore the northern coasts of the American continent. A pair of these graceful and elegant animals were brought away by the travellers on their return, and presented to the Society soon after their arrival in England, where the third was whelped. These, we believe, are the only individuals of the race that have ever been seen in Europe. Their air of frank and unsuspecting confidence is combined with an unusual share of gentleness and good temper. They seem perfectly at their ease and soon become familiar even with strangers. In their native country they are never known to bark, and this peculiarity is still retained by the elder dogs; but the younger one, which was born in this country, has learned to imitate the language of its fellows. They appear to be extremely valuable to the Indians by whom they are bred, who subsist almost entirely on the produce of the chase. "The Hare-Indian Dog," says Dr. Richardson, "has neither courage nor strength to fit it for pulling down any of the larger animals; but its broad feet and light make enable it to run over the snow without sinking, if the slightest crust is formed on it, and thus easily to overtake and tease the Moose or Reindeer, and keep them at bay until the hunters come up."



THE ESQUIMAUX DOG.

CANIS FAMILIARIS. Var. *BOREALIS.*

IN placing the Esquimaux Dog by the side of the Hare-Indian, we have been guided not so much by the degree of affinity subsisting between them, as by a desire to afford an opportunity for comparing, or, if the reader so please, for contrasting these two remarkable varieties of the canine species, the faithful companions of two races of mankind as distinct as the dogs themselves, and alike inhabitants of the same dreary climate, dependent on the same precarious means of subsistence, and sharers in the same toils, the same privations, and the same pursuits. This object will be sufficiently answered by the figure above given, and by a brief description of the specimen from which it was taken. For a more particular account of the qualities of his race we need hardly refer to the narratives of the various northern expeditions which have for the last twelve

years attracted so much of the public attention. In all of these the Esquimaux Dog forms so prominent a feature, as the patient and enduring friend, the bold, active, and experienced hunter, the laborious beast of burden, in a word the indispensable assistant of his master under all circumstances and in every emergency, that it is impossible to have read them without retaining a strong impression of the value of the services which he performs for the rude tribes who owe every thing to his docility and to his skill.

Our specimen is of a dingy white with a tinge of yellow on the upper parts, which gradually fades away upon the sides, and exhibits no appearance of the black markings so commonly seen in this variety. Its size is that of an English mastiff; its make robust and well proportioned; with a short but regularly diminishing muzzle; upright and pointed ears; strong and thick-set legs; and a long bushy tail covered with broadly diverging hairs and constantly curled upwards over the back. It was brought to this country by Lieutenant Henderson, one of the companions of Captain Ross, and is as quiet and good tempered as it is possible for a dog to be.





THE BARBARY MOUSE.

MUS BARBARUS. LINN.

THESE pretty little creatures are by far the most elegant of the troublesome and frequently destructive group to which they belong. They are moreover of very great rarity, at least in Europe, and do not appear to have fallen under the notice of any naturalist since the time of Linnæus, who first described them in the Addenda to the twelfth edition (the last published by himself) of his *Systema Naturæ*. So completely have they escaped the researches of later zoologists that M. Desmarest has even ventured to suggest a doubt of their existence, a doubt which can now no longer be entertained, three living specimens having remained in the Society's collection for upwards of a year.

The genus *Mus*, as at present circumscribed, is restricted to those species of Rats or Mice which have

in each jaw, in addition to the two incisors common to nearly the whole Order, three molar teeth on each side, fixed by distinct roots, and each surmounted by several rounded tubercles varying in number and position in the different teeth. The structure of the teeth sufficiently indicates that the chief subsistence of these animals is derived from the vegetable kingdom, but at the same time shows that they have no repugnance to animal food, especially when it has reached a certain state of decomposition. Indeed they have been frequently known, in times of scarcity, to carry their carnivorous propensity so far as to destroy and feed upon each other. Even without the stimulus of famine they will sometimes exhibit a similar tendency; for one of the individuals in the Society's collection having died, was found on examination to have been partly devoured by the survivors. Their tails are long, round, tapering to a point, and furnished only with a few scattered hairs or short bristles, emerging at intervals from beneath rings of scales formed by the epidermis or outer covering of the skin. They have generally four distinct toes on the fore feet, besides the rudiment of a thumb which is scarcely perceptible; and uniformly possess five on the hind feet, neither connected by a membrane nor fringed with stiff hairs as in some of the neighbouring genera. Many of the species are nevertheless excellent swimmers.

The animals of this group are all of small size, none of them exceeding a foot in total length, and some scarcely weighing more than a drachm, or the eighth part of an ounce. Their habits are subterraneous: living together in extensive colonies, they form superficial burrows in the earth, and swarm around the habitations and the labours of man, rendering themselves equally obnoxious to the good housewife and the industrious farmer. They

are excessively prolific, the females producing a numerous brood of young several times in the year, and the young speedily becoming adult. Their too rapid increase is, however, prevented by the various enemies, both among the feathered and the four-footed races of animals, to whose attacks they are exposed when they venture to quit their nests in search of food.

The ground colour of the Barbary Mouse is dark-brown, marked on each side with five or six yellowish stripes, about half as broad as the intervening spaces, extending along the whole length of the body, and becoming confused towards the under parts, which are nearly white. On the fore feet only three of the toes are at first sight visible; and this circumstance, mentioned in the specific character given by Linnæus, has led many subsequent naturalists to doubt whether the Barbary Mouse really belonged to the genus with which it was associated. Linnæus himself had, however, stated in his description of the species, that rudiments of a thumb and also of a fifth toe, were observable on a closer inspection; and this statement is fully confirmed by an examination of the specimens before us. Most of the doubts concerning their location have unquestionably arisen from the habit into which zoologists have unhappily fallen of referring to Gmelin's faulty compilation, in which this important modification of the character is altogether omitted, as though that work had absolutely superseded the original authority on which it is for the most part founded. It should also be mentioned that the teeth, which we were enabled to examine in the dead individual before alluded to, are precisely those of the other Rats; so that there can no longer exist any excuse for dreaming with Gmelin, that it might possibly be a Cavy.

There is, however, a trifling discrepancy between the

description of Linnæus and our specimens, which are intermediate in size between the Common Rat and Common Mouse, while Linnæus describes his to have been smaller even than the latter. But this difference may easily be accounted for on the supposition that he had seen none but very young individuals ; which is in some degree strengthened by his adding that they were occasionally marked by a scarcely perceptible line between the lateral stripes ; a circumstance which not unfrequently occurs in the young of striped animals. Slight vestiges of this original marking are still visible in the individuals now before us. In every other respect the coincidence is complete.

The specimens from which our figures were taken formed part of a nest of five, three of which, having survived the passage from Barbary to England, came into the possession of Lord Colchester, by whom they were presented to the Society in the spring of 1828. One of them has since died. The remaining two still continue healthy and lively ; and, with reference to the habits of the genus, are moderately tame, although shy and timid.





THE DIANA MONKEY.

CERCOPITHECUS DIANA. GEOFF.

THE Diana Monkey, so called by Linnæus from the fancied resemblance of the crescent-shaped bar which ornaments its brow to the ancient poetical representations of the goddess of the silver bow, was first figured by Marcgrave, in his Natural History of Brasil, under the name of Exquima, by which, according to him, it was known to the negroes of Congo, its native land. No subsequent naturalist appears to have observed it until Linnæus carefully described and figured it, in the Stockholm Transactions for 1754, from a living specimen, and gave a long and highly interesting account of its habits and behaviour. But this paper, probably on account of its being written in Swedish, or perhaps in consequence of the affected contempt with which the great French Natural Historian was

wont to treat the still greater Naturalist of the North, seems to have been so little known to Buffon, that the latter, setting aside the positive assertion of Marcgrave, whom alone he quotes, maintains that the Exquima must have been one of the prehensile-tailed Monkeys of the Western World. From this strange assertion, to which he was probably induced by the figure of one of these being erroneously introduced in the text in place of that of the African Monkey which was given on another page, and from his making no further mention of the animal, it appears that he had never seen a specimen. Allamand, however, in the Dutch edition of Buffon's Natural History, gave an excellent account of two living individuals which had fallen under his notice at Amsterdam, which he imagined to belong to a new species, and to which he first assigned the name of the Palatine, on account of the peculiar ruff of the fore part of the neck, but changed it afterwards for that of Rolo-way, by which he was informed that it was called in Guinea, from whence his specimens were brought. By this latter title it was received into the posthumous Supplement to Buffon published by Lacépède; and Gmelin, Pennant, and other compilers have adopted it as forming a distinct species from the Diana; a distinction altogether without a difference. We cannot, however, agree with M. Frédéric Cuvier in considering the Monkey figured by him, under the name of Diana, in the splendid *Histoire Naturelle des Mammifères*, as belonging to this species, of which it has none of the characteristic marks. It appears to us to be entirely new; but at the same time to be much more closely allied to *Cercopithecus Mona* than to the subject of the present article.

The animal before us clearly belongs to that extensive group of Monkeys of the Old World with long

tails and short muzzles, a facial angle exceeding fifty degrees, rounded heads slightly flattened in front, flat noses, and long posterior extremities, to which Baron Cuvier and M. Geoffroy-Saint-Hilaire have applied the generic name of *Cercopithecus*. Its colouring is peculiarly varied and graceful. The head, neck, sides, and middle of the body beneath, are of a deep ash-colour, which becomes gradually darker on the outside of the limbs, and is finally converted into a deep black upon the hands. The tail also exhibits the same tendency to assume a darker and a darker hue, and terminates in a point which is perfectly black. Perhaps the general colour may be best described as consisting of a mixture of black and white, in which the former greatly predominates, giving to the whole surface a slightly grizzled appearance. The hairs are for the most part tipped with white. The face is triangular, and, with the ears, intensely black. A straight line of long white hairs, surmounting a less obvious one of black, runs across the forehead above the eyes, extending nearly to the ears. The sides of the face are ornamented with broad tufts of white hairs, which are somewhat bushy, and terminate on the chin in a thin flat beard of two or three inches in length. These white hairs are continued down the front of the chest, and on the inside and anterior part of the fore legs, forming a large and well defined patch, which does not in the least run into or mingle with the ash-colour by which it is bordered. A similar patch, but of less extent, and of a yellowish orange, occupies the lower part of the abdomen, and extends down the inner and posterior sides of the hind legs; and the outer sides of the latter are marked by a narrow line of grayish hairs extending from the crupper to the knee. On the middle of the back a band of dark reddish

brown, equally well defined with the other markings, commences between the shoulders and extends to the root of the tail, becoming broader and broader as it advances backwards. The length of the animal from the extremity of the muzzle to the crupper is about eighteen inches, and that of the tail about two feet. It is furnished with small but distinct callosities; and with cheek-pouches of no very great extent.

The Diana Monkey is one of the most graceful and good-tempered of its tribe. Like the greater number of them, however, its disposition is more mild and pliant in youth than after it has attained its full maturity. It is fond of being caressed, and nods and grins with peculiar expression when pleased; but after a certain age it becomes more sedate and seldom indulges in these antics. Our specimen was for some months in the Collection at Bruton Street, and was moderately playful and quite familiar.





THE MONA MONKEY.

CERCOPITHECUS MONA. GEOFF.

THE name of Mona appears to be of Arabian origin, and is indiscriminately applied, under various modifications, by the Moors of Northern Africa, to all the long-tailed Monkeys without exception. From the language of the Moors it has passed into those of Spain and Portugal, in both of which it has precisely the same signification. We cannot, however, agree with Pennant and Buffon, who consider it, in its Egyptian form of Monichi, to have been the origin of the English word Monkey, which appears to us to admit of a much more obvious, though not very flattering, derivation, from the parent-stock of our native tongue. We have also considerable doubts of the accuracy of the latter author in referring the Cebus of the ancients to that particular species, to which, principally on account of its being a native of the north of Africa, he

has restricted the previously generic appellation of *Mona*. The descriptions of Monkeys left us by the classic authors of old are too meagre and confused to allow of our ascertaining with any certainty the species to which they were intended to apply ; and the variety of its colours cannot afford of itself a sufficient reason to identify the present animal with one of which we have handed down to us scarcely any other characteristic trait.

The *Mona* is a true *Cercopithecus*, and is still more beautiful in its markings and more graceful in its form than the *Diana* described in the preceding article. The top of its head is of a greenish yellow mingled with a slight tinge of black, and the neck, back, and sides are of a deep chestnut brown, passing downwards as far as the shoulders and haunches, where it changes into a dusky slate colour, which is continued on the limbs and tail. The latter organ is considerably longer than the body, and has on each side of its base a very remarkable white spot. The under surface of the body and the inside of the limbs are of a pure and delicate white, separated from the neighbouring colours by an abrupt line of demarcation. The naked upper part of the face, comprehending the orbits and the cheeks, is of a bluish purple ; the lips, and so much of the chin as is without hair, flesh-coloured. On the sides of the face large bushy whiskers of a light straw-colour, mixed with a few blackish rings, advance forwards and cover a considerable portion of the cheeks. Above the eyebrows is a transverse black band, extending on each side as far as the ears, and surmounted by a narrow crescent-shaped stripe of gray, which is sometimes scarcely visible. The ears and the hands are of a livid flesh-colour.

Of the manners and habits of these animals in a

state of nature we know but little. Buffon indeed refers to the account given by Ludolf in his History of Ethiopia of the Monkeys of that country as in all probability applicable to the present species; but it will be seen by a reference to the plate of the latter author that the animals there figured are in reality a species of Baboon. There is reason, however, to believe that the learned historian was not too scrupulous in respect to his figures of the animals of the country which he undertook to illustrate, as the very next plate in his work represents, as a native of Abyssinia, a species of Jacchus, a group strictly confined to the New World. It is therefore possible that these may be the Monkeys to which the text refers; and the account is altogether so curious that we cannot resist the temptation of transcribing it entire from the English translation of that singular work, published in 1684.

“Of Apes,” he says, “there are infinite flocks up and down in the mountains, a thousand and more together: there they leave no stone unturn’d. If they meet with one that two or three cannot lift, they call for more aid, and all for the sake of the Worms that lye under; a sort of dyet which they relish exceedingly. They are very greedy after Emmets. So that having found an Emmet-hill, they presently surround it, and laying their fore-paws with the hollow downward upon the ant-heap, as fast as the Emmets creep into their treacherous palmes, they lick ’em off with great Comfort to their Stomachs: and there they will lie till there is not an Emmet left. They are also pernicious to fruit and apples, and will destroy whole fields and gardens, unless they be carefully look’d after. For they are very cunning, and will never venture in till the return of their spies, which they send always before; who giving information that all things are safe, in they rush

with their whole Body, and make a quick dispatch. Therefore they go very quiet and silent to their prey; and if their young ones chance to make a noise, they chastise them with their fists, but if they find the coast clear, then every one hath a different noise to express his joy. Nor could there be any way to hinder them from further multiplying, but that they fall sometimes into the ruder hands of the wild beasts, which they have no way to avoid but by a timely flight, or by creeping into the clefts of the rocks. If they find no safety in flight they make a virtue of necessity, stand their ground, and filling their paws full of dust or sand, fling it full in the eyes of their assailant, and then to their heels again."

Of this marvellous history, the materials of which appear to have been furnished to our author by a native Abyssinian named Gregory, the reader is at full liberty to take or reject as much as he pleases. Later and more scientific writers, from the time of Buffon downwards, have concurred in describing the few isolated individuals which have fallen under their observation as peculiarly gentle, good-tempered, playful, and affectionate; and M. Frédéric Cuvier in particular has given a most flattering account of the good qualities of one which remained for a considerable time in the Paris Menagerie, where its amiable disposition was developed under his own immediate inspection, and was in no degree impaired by age. The individual, however, which is now in the Society's Collection, and which is shown by the size and strength of its teeth to be fully grown, is by no means deserving of so good a character, and exhibits occasionally a temper as capricious and as savage as is possessed by almost any of the tribe.



THE NAPU MUSK-DEER.

MOSCHUS JAVANICUS. RAFFLES.

THE typical species of the genus to which this singular little creature is usually referred is the Musk, an animal which, although completely unknown to the ancients, has become in modern times notorious over all the world for the peculiar odour of the secretion whence it derives its name. All the other species comprised in the genus are, however, destitute of the faculty of producing that costly perfume; and their union with the Musk is founded upon the general agreement existing between them in other more essential particulars. Still this remarkable difference, added to the great dissimilarity in the form and structure of their hoofs, and other minor points of discrepancy, furnishes an obvious means of subdividing the genus; and may probably, at some future time, when the

animals have become more completely known, be adopted as the foundation of a generic distinction. Those which compose the section to which the Napu belongs are of very diminutive stature, being the smallest and the most delicate of all the Ruminating Quadrupeds, and are on that account, no less than in consideration of the rarity of their appearance in this quarter of the globe, entitled to be regarded as objects of peculiar interest.

The characters by which the genus *Moschus*, as at present defined, is circumscribed, are plain and simple. It might indeed be sufficient to mention the entire want of horns or of bony protuberances in both sexes and at all ages, to distinguish them at once from every other group with which there is the slightest risk of their being confounded; for the Camels and the Llamas, which alone among the Ruminants have this character in common, have but little similarity with them in any other particular. But this peculiarity is also accompanied by others of a scarcely less important kind. In their general form they nearly resemble a Stag in miniature; but their face is proportionally much more elongated in front, their legs much more tapering and slender, and the height of their hinder parts much greater in comparison with that of their fore quarters. Their dentition is also different: they have the eight incisors in the lower jaw, corresponding with a vacant space in the upper, which are found in most ruminating beasts; and they have also six molars on each side of either jaw; but the crowns of the latter are surmounted by distinct tubercles, and the first in the upper and the first two in the lower are elevated into cutting edges and points similar to those of a carnivorous quadruped. In the upper jaw they have moreover two long canines, which in the males project

from the mouth in the form of tusks, and are generally curved backwards towards the points. None of them are provided with those cavities beneath the inner angles of the eyes, improperly termed lachrymal sacs, which are so conspicuous in many species of Deers and Antelopes; nor have any of them the thick tufts or brushes of hair on the fore part of the legs so common in the latter groups. The ears are rather small in size, and the eyes remarkably prominent. The tail is extremely short in the true Musk; but in the other species bears about the same proportion to the body as in the Stag. In the Musk the broad, deep, and expanded anterior or true hoofs are accompanied by corresponding posterior or accessory hoofs of nearly equal size and almost touching the ground; while in the rest of the group the anterior hoofs are narrow, elongated, and pointed, and the posterior, which are placed high above the others, bear little resemblance to them, but rather assume the appearance of straight, adpressed, conical, and pointed claws.

The synonymy of this little group has been much confused in consequence of the imperfect knowledge of the subject possessed by most of the writers who have attempted to elucidate it. It appears to consist, besides the Musk, of four species, one, the *Meminna*, a native of the Island of Ceylon, and the other three found in Java and Sumatra. With the *Meminna* we have at present no concern; it is well distinguished from the rest by its spotted livery, and no mistake has arisen with regard to it. But the ideas of naturalists appear to be yet in an unsettled state with respect to the others, and a perpetual change of names has been the consequence. In order to clear up as far as lies in our power this confusion, we shall have recourse to the first original descriptions, taken from living indi-

viduals and accurately defining the limits between the species, and shall entirely set aside the imperfect and unintelligible accounts previously published from dried and mutilated specimens. Acting upon this principle we take as a starting point Sir Stamford Raffles's Descriptive Catalogue of a Zoological Collection made in Sumatra, published in the nineteenth volume of the Transactions of the Linnean Society, as containing the earliest descriptions, as well as the most accurate hitherto published, of two of the species, and a cursory notice of the third. The species described are the Napu and the Kanchil of the natives of Sumatra, and that which is merely mentioned, the Pelandok.

In the excellent paper just quoted, Sir Stamford Raffles has cited Pallas as his authority for giving the name of *Javanicus* to the first of these species; but the brief description of that great zoologist is too imperfect to enable us to determine with precision to which of them his observations apply. As for Buffon's figure of the Chevrotain, it may be intended to represent either the one or the other, but it has the characters of neither; and Daubenton's descriptions which accompany it appear to comprise both. It is also somewhat doubtful to which of them Buffon's other figure of the Chevrotain de Java really belongs; but even were it clear that the latter represented the Kanchil, this circumstance would afford no ground for giving the name of *Javanicus* to it rather than to the Napu, inasmuch as Gmelin, who was the original contriver of the name, cites no other author than Pallas. We turn therefore from doubt and conjecture to positive certainty, and adopt without hesitation for the present species the earliest name that can be regarded as unquestionably its own.

The living specimen now before us clearly belongs

to the Napu of Sir Stamford Raffles, with the characters of which as detailed by him, as well as with several stuffed skins preserved in the noble collection presented by him to the Zoological Society, it agrees in every respect. In size it is about equal to a full grown Hare. Its colour above is dark glossy ferruginous brown resulting from the intermixture of black and fawn-coloured hairs, somewhat lighter along the middle line of the back, and varying in intensity according to the position in which it is seen. The under parts and inside of the legs are pure white, as are also the throat and chin. The fore part of the chest is nearly of the same colour with the back of the neck and is marked with three broad white radiating stripes commencing at the throat and passing, the central one into the white of the under surface of the body with the intervention only of a faint transverse band, and the two lateral ones nearly to the shoulders on each side. The bands of blackish brown which separate these stripes are perfectly distinct at their anterior part; a mark of considerable importance in distinguishing this species from the Kanchil. On either side a white line passes backwards on the cheeks for some little distance, from the margins of the lower lip, which are continuous with the white of the throat; and this marking, in the usual sitting posture of the animal, which is somewhat like that of the Hare in its form, gives it, when viewed in front, the appearance of having five radiating stripes on the chest. It is in all probability this circumstance, which is strongly represented in a front view of the animal given by M. Frédéric Cuvier in his *Histoire Naturelle des Mammifères*, that has induced that eminent zoologist to regard five radiating bands as the distinctive character of this species, and three as that of the Kanchil; whereas in truth the number is the same in both, and the difference

is only in their disposition. In the side view given in the same plate, and in the detailed description, this error has been avoided.

The back of the neck in the Napu is darker than the rest of the upper surface; and a still darker line passes from between the ears to the extremity of the nose, the line of profile being nearly straight, and terminating in a moist naked muzzle, extending forwards beyond the aperture of the mouth. In this the nostrils occupy a lateral position, forming two lengthened longitudinal slits. The muzzle itself is of a dusky black with a tinge of flesh-colour, as are also the ears, which are rather small, upright, and nearly naked, and two narrow lines passing from the eyes to the extremity of the nose. The eyes are very large, prominent, and remarkably brilliant. The tail is rather short, white beneath and at the tip; the legs are of moderate length and excessively slender; and the hoofs long, tapering, and pointed at the tip.

The Napu frequents thickets near the sea-shore, and feeds principally upon berries. It seldom visits the larger forests, which are the favourite resort of the Kanchil; for it does not possess either the agility or the cunning of the latter to secure it from danger, and prefers therefore the vicinity of man, with whom it readily becomes familiar, to that of the beasts of prey which inhabit the interior. When taken young it is tamed with the greatest facility. In captivity it appears perfectly at its ease, and quite indifferent to what is passing around it. Its full dark eye and placid air give it the appearance of a degree of intelligence which it does not really possess, for the greater part of its existence is passed in eating, drinking, and sleeping. Its voice is scarcely more than might be produced by a deep but still a gentle expiration.



THE PALM SQUIRREL.

SCIURUS PALMARUM. LINN. Var.

ALTHOUGH the curious little animals figured above differ most completely in colour from the Palm Squirrel in its ordinary state, there can be no doubt that they are nothing more than very remarkable, perhaps unique, varieties of that elegant and well known species. We are not, however, so well satisfied with regard to the genus in which both it and they ought to be placed. They seem, as M. F. Cuvier has already remarked, to form the type of a new one, intermediate between the tree-nesting and nut-cracking Squirrels on the one hand, and the burrowing and frugivorous *Tamias* on the other. But until their habits and organization shall have been more thoroughly investigated, we deem it best to leave them in the group of which they originally formed part, and with which they correspond in

the form of their teeth, in the number of their toes, in the outline of their form, and in almost every essential point of structure. The most important difference that has hitherto been observed between them consists in the narrowness and elongation of the anterior part of their face, which is even slenderer than that of the *Tamias*, and is strikingly contrasted with the extreme brevity of the same part in the genuine Squirrels.

In the arrangement of its colours also the Palm Squirrel approaches the former genus; insomuch that Ray was disposed to regard the common *Tamia* or Ground Squirrel as specifically identical with the present animal. We find, however, on a close examination considerable differences in their markings. Those of the Palm Squirrel consist of three whitish stripes, the middle one of which occupies the central line of the back, extending from the back of the head to the base of the tail, while the two lateral ones advance forwards above the ears and terminate near the eyes. The ground-colour is blackish brown above, and white below. The tail is covered with long hairs, diverging on each side like those of a Squirrel, and to nearly the same extent, and is occasionally elevated in a vertical position, but seldom brought forwards over the back. In the full grown animal it is about six inches in length, and rather longer than the body.

These creatures appear to be common in India, and to be particularly plentiful in the towns and villages, taking up their abodes on the roofs of houses and in old walls, in the cavities of which the female deposits her young. They commit great devastations in the orchards, destroying and devouring all kinds of fruit; and are so familiar as even to enter the houses and pick up the crumbs that fall from the tables. Their name is derived from their being often seen on palm-

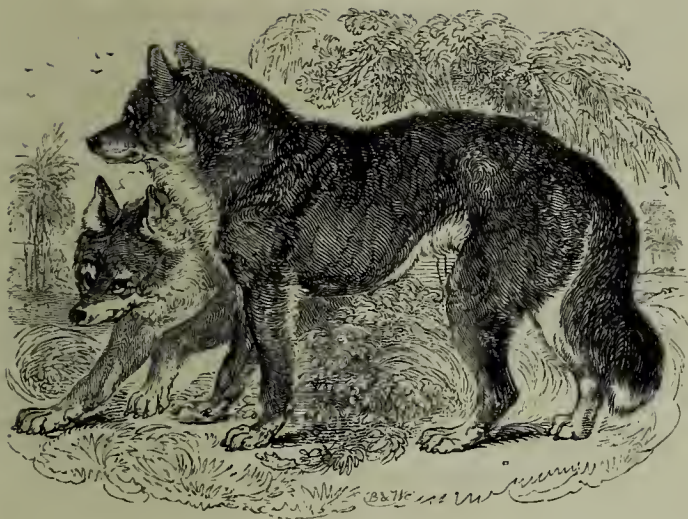
trees, which in the East are always found in the neighbourhood of the habitations of men.

So social an animal even in its wild state may naturally be expected to become very good-tempered and familiar in captivity; and accordingly we find it celebrated for these qualities from the time of its earliest describers. Clusius, to whom we are indebted for the first recognisable description of the species, particularly remarks the tameness of the individuals seen by him, which were so completely domesticated as to be suffered to ramble about at perfect liberty whithersoever they pleased, and so familiar as to take refuge in the bosoms of the sailors of the vessel in which they were brought to Europe. This docility must have appeared the more remarkable to him as he mistook them for a species of Weasel, and gave them the name of *Mustela Africana*, involving a second blunder as to the country from whence they were obtained. The latter error has been continued by the carelessness of various compilers down to our own times, and has even been increased by the addition of America to the list of localities in which these animals were said to be found. Thus we continually find the wide extent of Asia, Africa, and America referred to as producing them, while they are in reality strictly confined to the south-eastern portion of the former continent and its neighbouring islands. It is probable that some confusion between the Palm Squirrel and the *Tamias* of America may have given occasion for the introduction of the latter locality.

One of the varieties figured in our cut was perfectly black, and exhibited no traces of the stripes so characteristic of the species in its usual livery. It died in the spring of the present year, and its skin alone now remains in the Society's Museum. The other, which, to judge from the redness of its eyes, is nearly a perfect

albino, is of a dull reddish white, marked with three very faint stripes of a still lighter hue. Like the individuals described by Clusius they were both remarkably tame, and similar in their manners to the genuine Squirrels. They always ate sitting upright upon their haunches, and conveying their food, which was entirely vegetable and consisted chiefly of bread, to their mouths between their fore paws. They were presented to the Society in the summer of 1828, but no particulars were given with regard to their origin or previous history. The albino variety is still living, and forms part of the collection in Bruton Street.





THE DINGO, OR AUSTRALIAN DOG.

CANIS FAMILIARIS. Var. *AUSTRALASIÆ.*

WHETHER the numberless breeds of Dogs, which are the companions of the human race in every region of the globe, were originally descended from one common stock, and owe their infinite varieties solely to their complete domestication, the modifications by which they are distinguished having been gradually produced by the influence of circumstances: whether, on the contrary, they are derived from the intermixture of different species, now so completely blended together as to render it impossible to trace out the line of their descent: and whether, on either supposition, the primæval race or races still exist in a state of nature, are questions which have baffled the ingenuity of the most celebrated naturalists. Theory after theory has been advanced, and the problem is still as eagerly debated

as ever, and with as little probability of arriving at a satisfactory conclusion. In the investigation of this difficult subject, however, as in the search after the philosopher's stone, many curious facts have been brought to light, which would otherwise in all probability have remained buried in obscurity; and the causes which are continually operating to produce a gradual change of character, both in outward form and in intellectual capacity, among the brute creation, have received considerable elucidation. It is thus that theories, however erroneous in themselves, are frequently made subservient to the advancement of science, by the important facts which are incidentally developed by their authors in the ardour of their zeal for the establishment of a favourite hypothesis.

It is by no means our intention to enter upon the discussion of so extensive a question. But while we purposely abstain from inquiring what was the original Dog, before he was reclaimed (if such a period ever existed) to the service of man, we cannot shut our eyes to the fact that in the specimens now before us we have him in that condition in which he may be supposed to approach most nearly to a state of nature, as the companion of a race of savages, the lowest in the scale of intellect that have been met with in the world. From the observation of the characters, physical and moral, which he presents in this first stage of cultivation, some idea may perhaps be deduced of what a Dog would be without any cultivation whatever; but it should always be borne in mind that even amongst the most savage nations the Dogs are as distinct in character as the tribes they serve, and that their degree of intellectual developement frequently outstrips that of the masters who hold them in subjection.

The Australian Dog was observed, but scarcely re-

cognised as belonging to the canine species, by some of the earlier navigators who touched upon the coast of New Holland. In the narrative of his Voyage round the World, under the date of 1688, Dampier speaks of "the tread of a Beast as big as a great Mastiff-Dog," as the only visible symptom of the existence of any quadruped in the part of the country which he then visited. In the account of his subsequent Voyage to New Holland, performed in 1699, he refers to his former statement, and adds that his "Men saw two or three Beasts like hungry Wolves, lean like so many Skeletons, being nothing but Skin and Bones." But though the animal was thus early noticed, no particular account of it was given to the world until the publication of Governor Phillip's Voyage to Botany Bay, which contained a tolerably accurate figure and description, taken from a living specimen in the possession of the Marchioness of Salisbury. It was again represented in Shaw's General Zoology; and another original figure, together with minute details of its organization, and in particular of its skeleton, derived from the examination of an individual which had lived for some time in the Paris Menagerie, has since been published by M. F. Cuvier. To the work of the latter gentleman we would particularly refer such of our readers as are desirous of becoming acquainted with the more strictly technical peculiarities of this remarkable breed.

In size the New Holland Dog is about equal to the common House Dog or Lurcher, which it also resembles in its proportions. Its body is moderately thick; its legs strong and muscular; its head broad behind and tapering into a short pointed muzzle; its ears short, pricked, and generally directed forwards; and its tail rather long, bushy, and most commonly pendulous. Its hair is long, straight, and close; of a deep fawn-

colour in the upper parts, paler on the sides, and almost white on the under surface, on the inside of the limbs, and on the muzzle. In strength and agility it is superior to most other dogs of the same size, and it will attack without the least hesitation those which are considerably larger than itself. The individual confined in the French Menagerie even evinced a disposition to fly upon the Jaguars, Leopards, and Bears, whenever it caught a glimpse of them through the bars of its den. That which is described in Phillip's Voyage is said to have been so fierce that no other animal could approach it with safety. A poor ass had once nearly fallen a victim to its savageness of disposition ; and it had been known to run down both deer and sheep.

The ferocity of the New Holland Dog, like that of most wild animals, appears to be in a great measure the result of his want of confidence in those by whom he is surrounded. He rarely becomes perfectly familiar even with the individuals who are constantly about him ; and of strangers he seems to live in continual dread. His constrained and skulking gait ; the startled air which he instantly assumes on the slightest unusual occurrence ; the suspicious eagerness with which he watches the motions of those who approach him ; clearly indicate that he is not at his ease in the society of civilized man. The specimens in the Garden appear, however, to have shaken off some of their original wildness, and to have begun to accustom themselves in some degree to the circumstances in which they are placed. One of them has been for nearly two years in the Society's possession ; the second is a much later acquisition.



THE COLLARED PECCARY.

DICOTYLES TORQUATUS. CUV.

THE Peccaries, although bearing a close affinity both in external form and internal structure to the common Hog, are nevertheless distinguished from that well known beast by several striking characters, of sufficient importance, when taken in conjunction with their transatlantic origin, to justify their separation as a distinct genus. The most essential of these characters consist in the number and direction of their téeth, the structure of their hinder feet, the form of their head and snout, the shortness and flatness of their tail, and the existence of a peculiar glandular apparatus. They have in the upper jaw four incisor teeth instead of six, the number found in the Pigs of the Old World; and six in the lower. Of these the two outer are separated from the intermediate ones by a vacant space, and are

smaller in size and of a more conical form. Before the canines of each jaw there occurs another interval, which is occupied in the upper, when the mouth is closed, by the canine of the lower; while that of the upper projects from the mouth in the form of a tusk, and is not received into any corresponding groove. These teeth are from an inch to an inch and a quarter in length, strong, thick, and triangular. They are succeeded by a third interval, behind which, on each side of either jaw, are ranged six nearly equal molars, instead of seven, the number met with in the common Hog.

In the latter all the feet are well known to be formed of two anterior toes, and these are properly speaking intermediate between two others which take a backward direction, are much smaller in size, and placed so much above the level of the foot as seldom to touch the ground in walking. The same structure is observed in the Peccaries, with the exception that on their hind feet the outer one of the smaller or posterior toes is entirely wanting, and they have consequently but three toes instead of four. Their head is shorter and broader than that of the Hog; but the moveable snout by which their face is terminated is proportionally longer, and its flat and truncated extremity is bordered by a more expanded margin. The legs are also slenderer in their proportions; and the tail, which is scarcely visible among the bristles, instead of being taper, conical, and curled upwards, is extremely short, remarkably flat, and completely pendulous. But the most striking distinction between them and every other known species of quadruped appears to consist in a large gland placed immediately beneath the skin on the middle of the loins, and readily discernible on turning up the long bristles by which it is covered. This operation is, however, far from pleasant, and is besides by no means

indispensable ; the filthy and disgusting smell emitted by the fluid which is secreted by the gland in large quantities, furnishing of itself a sufficient and to any sensible nostril a perfectly satisfactory indication of its existence.

The Peccaries resemble the Common Hog not more in their form and structure than in their habits, disposition, and propensities. Their gait is almost precisely similar ; they burrow in the earth after the same fashion ; eat and drink in the same swinish manner ; are fond of the same description of food ; elevate their long bristles like him when terrified or angry ; breathe with the same violent effort ; and express their feelings with the same peculiar grunt. They are also equally susceptible of domestication ; or perhaps we should rather say much more so, if we adopt the Wild Boar of Europe as the type of the domesticated race. When taken young they readily become habituated to the society of man ; take as much delight as our pigs in being scratched and scrubbed ; and are speedily reduced to a state of complete subservience. They are not, however, likely ever to become so useful in the farm-yard, for not to speak of their fetid gland, which is said to communicate a very disagreeable savour to their flesh if not removed immediately after death, the flesh itself is decidedly inferior to pork both in flavour and fatness : their productiveness also bears no comparison to that of the Sow, the female bringing forth but once a year and producing no more than two young ones at a birth. The experiment of breeding them has, however, we are informed, been tried in various parts of the continent of South America, and in some of the West India Islands ; but we are not aware of the extent to which it has succeeded, or whether the project has not been altogether laid aside.

Both the species of this group appear to be more or

less common throughout the whole of South America. They inhabit only the thickest and most extensive forests, and take up their dwellings in the hollows of trees or in burrows formed in the earth by other animals. They are rarely found in any considerable numbers in the neighbourhood of villages, but sometimes commit great devastation among the sugar-canes, the maize, the manihot, and the potatoe crops. They are generally said to be extremely savage; but the difference between the two species in this respect, as well as in various other particulars of manners and disposition, appears to be even more strongly marked than that which distinguishes their external form.

The animal figured at the head of the present article, and to which we have applied the name of the Collared Peccary, is the *Patira* of Sonnini, and the *Taytétou* of D'Azara, who first clearly established the difference between the two species, which had previously been confounded together. It is smaller than the other, seldom measuring fully three feet in length, and rarely weighing more than fifty pounds. Its general colour is a yellowish gray, resulting from the manner in which the bristles are marked by alternate rings of grayish straw-colour and black. A row of long black bristles extends backwards from between the ears, forming a somewhat erectile mane on the back of the neck, and becoming gradually longer as they approach the tail. The face is more grizzled with yellow than any other part, with the exception of a narrow oblique line of yellow-pointed hairs, which passes from behind the shoulders to the fore part of the neck, and from which the specific name of the animal is derived. The colour of the legs, as well as of the hoofs which envelope the extremities of the toes, is nearly black. The head is extremely long, the profile forming almost a straight line from between the ears to the extremity

of the nose, which projects considerably beyond the mouth, is very moveable, and terminates abruptly in a broad and flat expansion, in which the large open nostrils are placed far apart from each other. The ears are small, upright, nearly naked, and of a grayish colour. On the legs and muzzle the hairs are extremely short. The colour of the young ones is for the first year of a uniform reddish brown.

The Collared Peccary is not a migratory animal. It generally passes its life in the forest in which it first saw the light, where it is usually met with in pairs or in small families. They subsist for the most part on vegetable food, chiefly roots, which they procure by burrowing in the earth. They will, however, sometimes feed upon fish and reptiles, and are said to be dexterous in destroying serpents. Their peculiar grunt is heard at a considerable distance; but they are more easily traced by the nose than by the ear. The places which they inhabit, or even those through which they merely pass, are absolutely infected with the pungent odour of the liquid which is secreted by their dorsal gland: it is a certain direction to those who are in quest of them, and affords the greatest facility in their pursuit. D'Azara seems to have had an unaccountable partiality for this smell, which he first describes as "a musky scent;" and afterwards, as if this were not sufficient, rates Buffon severely for calling it an unsavoury odour, and quotes the authority of Ray (which should have been Tyson) and others for its being "musky, sweet, and agreeable." He admits, however, that the animal may exhale different odours according to the quality of its nutriment, its state of irritation, or a variety of other circumstances. Sonnini and every other recent author who has mentioned it concur in regarding it as most disgusting; and there are few, we apprehend, among our readers who would enjoy being placed for

any considerable length of time to the leeward of the Peccaries in the Society's Garden.

When reduced to a state of captivity, the Peccaries, as we have said before, become perfectly tame and domesticated. A pair of them which were in the French Menagerie lived upon the best terms with the dogs and all the other domestic animals ; they returned of their own accord to their sty ; came when they were called ; and appeared fond of being noticed. But they were also fond of their liberty, and tried to escape, and sometimes even to bite, when they were forcibly driven into their place of confinement. They were fed upon bread and fruits, but ate of every thing that was offered them like the common pig. When frightened they uttered a sharp cry, and testified their satisfaction by a low grunt. Very similar in character are those which occupy a sty in the most remote corner of the Society's Garden. They seem, however, to be more patient of cold than those of the Paris Menagerie, which are stated to have suffered much from its influence. Our specimens have lived and thriven throughout two winters with no more than their usual protection. They are perfectly tame and quiet ; but their projecting tusks give them rather a formidable air ; and it might not be altogether safe to trust them too far.





THE WHITE-LIPPED PECCARY.

DICOTYLES LABIATUS. Cuv.

THE present species, according to M. Sonnini, is exclusively known in Guiana by the name of Peccary, although that denomination is now commonly applied in Europe to both it and the Patira of the same country described in the preceding article. It is also the Tag-nicati of M. D'Azara, from whom and from the author just quoted most of our information relative to the habits of these animals in their native land has been derived. In size it is considerably larger than the other species, frequently measuring three feet and a half in length, and sometimes attaining the weight of a hundred pounds. In form and proportions it is thicker and stouter, with shorter legs, and a longer snout; and the abrupt termination of that part is still more expanded and flattened out than that of the Collared Peccary. In its colour it has little of the grayish tinge

which characterizes the latter, the black hairs of the back and sides having only a few brownish rings, which are rather more thickly spread on the sides of the head beneath the ears. These organs are less remarkable than in the other species in consequence partly of the greater length of the mane, which advances forwards between them, and is continued down the back towards the tail, the bristles of which it is composed being very thick and somewhat flattened. The whiskers consist of long black scattered bristles; and a few others of a similar description project just above the eyes. The whole of the under lip, together with the sides of the mouth and the upper surface of the nose, are white. The legs and hoofs are black; and the latter are long and narrow, the posterior one of the hinder feet almost touching the ground. The tusks are longer and more visible externally than in the Patira. In the young animal the livery is more varied, being in some degree striped like that of the young Wild Boar of Europe; but these stripes are lost by degrees as the animal advances in age, and few traces of them remain after the first year.

Unlike the former species the White-lipped Peccaries congregate in numerous bands, sometimes amounting, it is said, to more than a thousand individuals of all ages. Thus united they frequently traverse extensive districts, the whole troop occupying an extent of a league in length, and directed in their march, if the accounts of the natives are to be credited, by a leader, who takes his station at the head of the foremost rank. Should they be impeded in their progress by a river, the chief stops for a moment, and then plunges boldly into the stream, and is followed by all the rest of the troop. The breadth of the river or the rapidity of the current appear to be but trifling obstacles in their way,

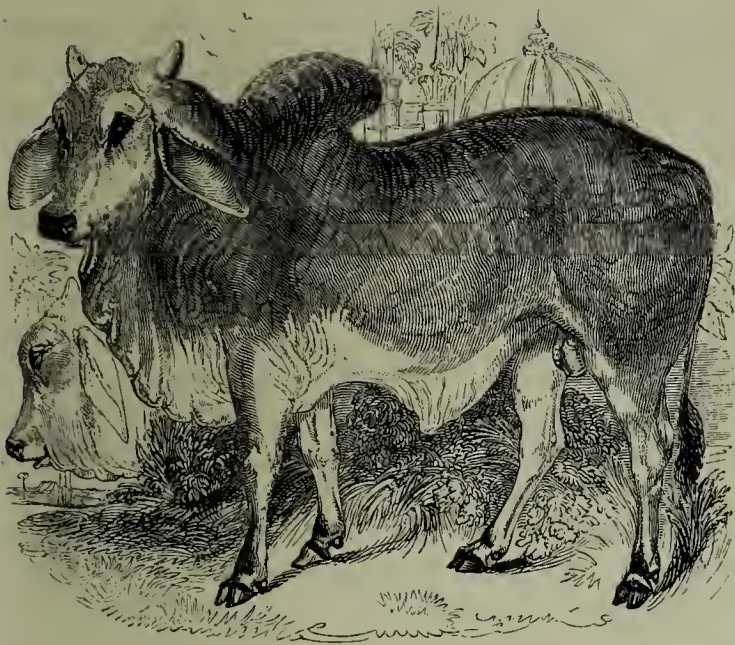
and to be overcome with the greatest facility. On reaching the opposite bank they proceed directly on their course, and continue their march even through the plantations which, unfortunately for the owners, may happen to lie in their way ; and which they sometimes completely devastate by rooting in the ground for their favourite food, or devouring such fruits as they find there. If they meet with any thing unusual on their way, they make a terrific clattering with their teeth, and stop and examine the object of their alarm. When they have ascertained that there is no danger, they continue their route without further delay ; but if a huntsman should venture to attack them when they are thus assembled in large numbers, he is sure to be surrounded by multitudes and torn to pieces by their tusks, if he is so unwise as to neglect his only chance of escape, which consists in climbing a tree, and thus getting fairly out of their reach. The smaller bands are by no means equally courageous, and always take to flight at the first attack.

M. Sonnini relates that he was often, in the course of his travels in Guiana, surrounded by a troop of Peccaries infuriated with the havoc made by the muskets of himself and his companions. Mounted upon a tree he was enabled to observe their motions, and to notice the manner in which they encouraged by their grunts and by the rubbing of their snouts together those among them who were injured by the shots which were poured upon them from above. With erected bristles and eyes sparkling with rage, they still maintained their ground ; and it was sometimes only after two or three hours incessant firing that they were at last compelled to quit the field of battle, and to leave the bodies of the dead to the mercy of the conquerors. These days of victory over the Peccaries, he adds, are always days of abundance for the traveller in those

immense forests, who has no other resource except the chase. An enormous gridiron is immediately constructed with sticks fixed in the earth, and three feet in height, over which a quantity of small branches are placed in a transverse direction. On these the Peccaries are deposited after being cut in pieces, and are cooked by a slow fire, which is kept up during the whole night. From the enthusiasm with which our author speaks of his desert feasts, and the regret which he expresses that he is no longer a sharer in them, we may readily imagine that, under the circumstances in which he partook of them, they must have been an exquisite treat. It does not, however, follow as a necessary consequence that in other places and at other times he might have been so well disposed to relish these delicacies of the forest.

Of this species the Society has but a single specimen, which in its habits and behaviour is perfectly similar to the Collared Peccaries inhabiting the neighbouring sty. It has been generally said that the secretion from its dorsal gland is inodorous; but M. Sonnini makes no distinction in this respect between the two; and the individual now before us, if not quite so offensive as the others, is nevertheless sufficiently so to render its proximity not very desirable.





THE INDIAN OX.

Bos TAURUS. Var. *INDICUS.*

IN addition to the domesticated species known by the names of Oxen, Buffaloes, and Yaks, the genus *Bos* comprehends several others equally distinct, which have rarely, if ever, been reclaimed from their native wildness. Two of these, the Bison and the Musk Ox, are peculiar to the Northern regions of America ; one, the Polish Aurochs, is now confined to a single European forest ; a fourth, the Arni, exists only in Central Asia ; and a fifth, the Cape Buffalo, is, as its name imports, a native of the Southern extremity of Africa. Thus it appears that in this wide dispersion of the several races, each region has preserved its own peculiar kind in its original independence ; while, on the other hand, two at least of the remaining species, the Ox and the

Buffalo, which are no longer to be found in a state of nature, have been industriously propagated, under the auspices of man, throughout almost every part of the surface of the globe. The Yak alone, of all the domestic species, remains confined within its primitive limits, in Thibet namely and a part of Tartary, where it is said to be generally cultivated, almost to the exclusion of every other race.

The characters by which the strongly marked group of animals thus associated together are distinguished from the neighbouring tribes, are, like most of those which serve to subdivide the great family of the Ruminants, of a very subordinate description. Their horns are common to both sexes, simple in their form, curved outwards at the base and upwards towards the point, and supported internally by bony processes arising from the skull, having cavities within them communicating with the frontal sinuses, which are largely developed. Their muzzle is of large size; the skin along the middle of the neck and chest forms a pendulous dewlap of greater or less extent; and the general robustness of their make is strikingly contrasted with the lightness and elegance of form of some of the nearly related groups.

In enumerating the species of which this genus is composed we have abstained from mentioning the Zebu or Indian Ox, simply because we do not consider it entitled to hold that rank in the scale of nature. There can be little doubt that it is merely a variety of the Common Ox, although it is difficult to ascertain the causes by which the distinctive characters of the two races have been in the process of time gradually produced. But whatever the causes may have been, their effects rapidly disappear by the intermixture of the breeds, and are entirely lost at the end of a few gene-

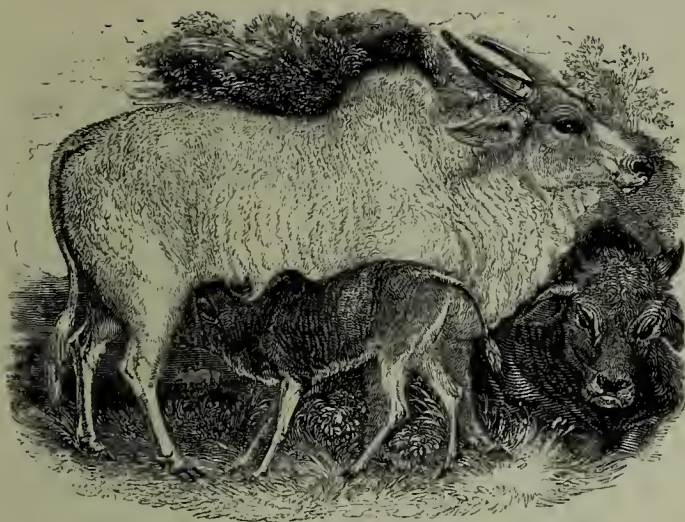
rations. This intermixture and its results would alone furnish a sufficient proof of identity of origin ; which consequently scarcely requires the confirmation to be derived from the perfect agreement of their internal structure, and of all the more essential particulars of their external conformation. These, however, are not wanting : not only is their anatomical structure the same, but the form of their heads, which affords the only certain means of distinguishing the actual species of this genus from each other, presents no difference whatever. In both the forehead is flat, or more properly slightly depressed ; nearly square in its outline, its height being equal to its breadth ; and bounded above by a prominent line, forming an angular protuberance, passing directly across the skull between the bases of the horns. The only circumstances in fact in which the two animals differ consist in the fatty hump on the shoulders of the Zebu, and in the somewhat more slender and delicate make of its legs.

Numerous breeds of this humped variety, varying in size from that of a large Mastiff-dog to that of a full grown Buffalo, are spread, more or less extensively, over the whole of Southern Asia, the Islands of the Indian Archipelago, and the Eastern coast of Africa from Abyssinia to the Cape of Good Hope. In all these countries the Zebu supplies the place of the Ox both as a beast of burthen and as an article of food and domestic economy. In some parts of India it executes the duties of the horse also, being either saddled and ridden, or harnessed in a carriage, and performing in this manner journeys of considerable length with tolerable celerity. Some of the older writers speak of fifty or sixty miles a day as its usual rate of travelling ; but the more moderate computation of recent authors does not exceed from twenty to thirty. Its beef is consi-

dered by no means despicable, although far from equaling that of the European Ox. The hump, which is chiefly composed of fat, is reckoned the most delicate part.

As might naturally be expected from its perfect domestication and wide diffusion, the Zebu is subject to as great a variety of colours as those which affect the European race. Its most common hue is a light ashy gray, passing into a cream colour or milk-white; but it is not unfrequently marked with various shades of red or brown, and occasionally it becomes perfectly black. Its hump is sometimes elevated in a remarkable degree, and usually retains its upright position; but sometimes it becomes half pendulous and hangs partly over towards one side. Instances are cited in which it had attained the enormous weight of fifty pounds. A distinct breed is spoken of as common in Surat, which is furnished with a second hump. Among the other breeds there are some which are entirely destitute of horns, and others which have only the semblance of them, the external covering being unsupported by bony processes, and being consequently flexible and pendulous.

The specimen now before us is one of the largest that has ever been seen in Europe. It is fully equal in size to the larger breeds of our native oxen, and is of a slaty gray on the body and head; with cream-coloured legs and dewlap, the latter exceedingly long and pendulous; very short horns directed upwards and outwards; and ears of great proportional magnitude, and so flexible and obedient to the animal's will as to be moved in all directions with the greatest facility. Although a full-grown male he is perfectly quiet, good tempered, and submissive.



THE ZEBU.

Bos TAURUS. Var. INDICUS.

THERE is little difference, except in size, between this, the more common of the Indian breeds, and that which we have just described. Both are evidently descended from the same original stock; and the distinctions between them are merely such as we know to be produced by the influence of cultivation, of climate, and of food. It is nevertheless a remarkable fact that the same region should produce two breeds so strikingly unequal in size; and no less so that in a country in which the nearly related species of the Buffalo has reached its maximum of developement, the Common Ox should have dwindled down to its minimum point of degradation. In spite, however, of this degeneracy it has lost none of those good qualities which have rendered it so essential to the comforts and almost to the existence of the human race; but exhibits even

more docility, and greater intelligence, as well as more activity of limb, than fall to the lot of the common European race.

Of this smaller race the Society has at present numerous specimens, which vary considerably in their colours, the shape and extent of their horns, the size of their humps, and other equally unimportant particulars. But the same general forms, and the same quiet mildness of disposition, are observable in all the individuals which have come under our notice, including several specimens of a yet smaller race, which scarcely exceeds two feet in height and measures little more than three feet in total length.

The whole of the breeds are treated with great veneration by the Hindoos, who hold it sinful to deprive them of life under any pretext whatever. But they do not, in general, scruple to make the animals labour for their benefit; although they consider it the height of impiety to eat of their flesh. A select number are, however, exempted from all services, and have the privilege of straying about the towns and villages, and of taking their food wheresoever they please, if not sufficiently supplied by the pious contributions of the devotees who impose on themselves this charitable office.





THE SQUIRREL PETAURUS.

PETAURUS SCIUREUS. GEOFF.

IN referring this beautiful little quadruped to the genus *Petaurus*, from the typical species of which it differs in the character of its teeth, we are influenced by no desire to set aside the established maxim that the teeth furnish the best means of distinguishing the primary groups of the *Mammalia* from each other. But there is no general law without an exception; and such exceptions occur too frequently in the department of zoology which at present engages our attention, to allow of the rigorous application of any artificial rule to the entire series, however generally correct may be the principle on which it is founded.

Of the mischievous tendency of too pertinacious an adherence to a preconceived opinion of the value and

universality of certain characters, the instance before us furnishes a striking example. Relying solely on the discrepancy or agreement of the dentary systems, and putting entirely out of the question all consideration of other and essential points of structure, M. Frédéric Cuvier has reunited the old genus *Phalangista*, in order again to subdivide it into two incongruous and heterogeneous groups; in the one confounding two well marked species of flying *Petauri*, not only with the climbing *Phalangistæ* of New Holland, but with the naked-tailed and strictly prehensile *Couscous* of the Moluccas; and repaying the other group, which he had so unnecessarily dismembered, by the addition of a true *Phalangista*, whose only pretensions to such an association are made to depend on a somewhat similar arrangement of the teeth. By thus confining himself to a single character, he has broken up the regular series of affinities which connected together three marked, but still closely allied, gradations of form, to substitute an arrangement which has no other recommendation than its accordance with the theoretic views of its author. In such a case we cannot hesitate in giving to the organs of locomotion, combined with the general habit, that precedence before those of mastication, which under other circumstances we are generally in the habit of conceding to the latter; and we feel the less repugnance to adopting this course, because it is admitted that the dentary formula is in these animals subject to some variation, and because zoologists are by no means agreed with respect to its exact definition.

The teeth of the Squirrel *Petaurus* agree generally, according to M. Frédéric Cuvier, with those of the *Phalangistas*. They are consequently thirty-eight in number, twenty occupying the upper jaw, and eighteen

the lower. The former are divided by the same eminent naturalist into six incisors, four canines, two false molars, and eight true ones; the latter consisting of two incisors, and no canines, with eight false and as many true molars. The dentary character of the original species of *Petaurus*, which he takes as the type of his other group, differs chiefly in the total want of canine teeth; but we may here be permitted to observe that it appears to us somewhat doubtful how far those which are above enumerated as such truly deserve the name which has been applied to them.

In every other respect the little creature in question perfectly agrees with the group of animals to which we have restored it; and which are at once characterized by the broad expansion of their skin on each side of the body, extending between the anterior and posterior limbs as in the Flying Squirrels, to which indeed they bear a close resemblance. In common with nearly the whole of the Mammiferous Quadrupeds of the country which they inhabit, they possess the abdominal pouch which fixes their place in the system among the Marsupial animals; and as in many of these, the thumbs of their hind feet are long and distinctly opposable to the sole. The other toes are four in number, and furnished with tolerably strong claws, of which the thumbs are destitute. The fore feet have five long radiating toes, the middle one of which is the longest, all armed with similar claws to those of the hind feet. The tail is round, covered with loose hair, somewhat tapering towards the point, and not strictly prehensile, having no naked surface at its extremity beneath.

In size the present species is about equal to the Common Squirrel; and its tail is rather longer than its body. Its colour is delicately gray above, somewhat darker on the head, and white beneath. A black line

passes from the point of the nose along the back towards the tail ; and the lateral folds of the skin are bounded in front and on the sides by a similar band, which confounds itself gradually on the inside with the gray of the body and is bordered at the outer margin by a fringe of white. The eyes are each placed in a spot of black, and a faint blackish line extends along the upper surface of the hinder limbs. The tail is also of a darker hue, especially towards its extremity.

It is an inhabitant of New South Wales, and is said to be particularly plentiful at the foot of the Blue Mountains. Its fur is extremely soft and beautiful, and, like that of the other species of *Petaurus*, is occasionally made use of by the natives to form the scanty covering worn by some few among the least barbarous of the race. Could it be obtained in sufficient quantity, of which from the statements regarding its abundance there can be little doubt, it would unquestionably furnish one of the most elegant and delicate furs with which we are acquainted, and might form a useful branch of commerce in that distant and improving colony.

Another locality assigned to the Squirrel *Petaurus* is Norfolk Island. For this we know of no other authority than that which is derived from the name by which it was originally designated in Governor Phillip's Voyage to Botany Bay, that of the Norfolk Island Flying Squirrel. In the same Voyage appeared the first published figure of it ; and a good representation, nearly of the size of life, was soon afterwards given, from a living specimen then in England, in Dr. Shaw's Zoology of New Holland. A copy of the latter has been reproduced in the General Zoology of the same author.

During the day the animal generally remains quietly

nestled in the hollows of the trees ; but becomes animated as night advances, and skims through the air, supported by its lateral expansions, half leaping, half flying, from branch to branch, feeding upon leaves and upon insects. This peculiar mode of locomotion can scarcely be considered as a true flight, inasmuch as the cutaneous folds which serve the purposes of wings seem rather destined for the mere support of the animal in its long and apparently desperate leaps, than for raising it in the air and directing its course towards any given object. For this latter purpose they are indeed but little fitted by their structure, the want of proper muscles in a great measure incapacitating them from performing such offices as are dependent on volition. It may be doubted, however, whether these animals are entirely destitute of the power of exercising their will in their flight-like leaps. For the following anecdote bearing upon this subject we are indebted to our friend Mr. Broderip, who related it to us on unquestionable authority.

On board a vessel sailing off the coast of New Holland was a Squirrel Petaurus, which was permitted to roam about the ship. On one occasion it reached the mast-head, and as the sailor, who was dispatched to bring it down, approached, made a spring from aloft to avoid him. At this moment the ship gave a heavy lurch, which, if the original direction of the little creature's course had been continued, must have plunged it into the sea. All who witnessed the scene were in pain for its safety ; but it suddenly appeared to check itself and so to modify its career that it alighted safely on the deck.

Does not this fact demonstrate something like the existence in these organs of a certain degree of subser-

vience to the will, sufficient at least to counteract the original impulse by which they were put in motion, and to turn aside their course on the appearance of any sudden danger?

The specimen from which our figures were taken is completely nocturnal in its habits, seldom quitting the inner compartment of its cage until the approach of evening, when it becomes extremely lively and active. It has now been for some months in Bruton Street, and is perfectly tame, but rather shy. It was formerly in the possession of the Marchioness of Cleveland, and was procured for the Society by the kind offices of Lady Glengall.





THE WHITE EYELID MONKEY.

CERCOCEBUS FULIGINOSUS. GEOFF.

ALTHOUGH we have adopted M. Geoffroy-Saint-Hilaire's name for this and the succeeding animal, we are by no means satisfied that they ought to be separated from the genus *Cercopithecus*, with the genuine species of which they agree in all the most essential particulars. Their facial angle, it is true, is rather more prolonged, and does not, at the adult age, exceed 45° ; the margins of their orbits are somewhat more elevated; their cheek-pouches and their callosities are proportionally larger; and their limbs are more slender and elongated: but these are merely differences of degree, and are not connected with any essential variation in dentary character or geographical distribution.

This Monkey was called by Buffon the Mangabey, from an erroneous idea that his specimens were obtained from the territory of that name in the Island of Madagascar: it appears, however, more probable that it is

a native of the Western coast of Africa. Its common English designation of the White Eyelid is certainly both expressive and appropriate; for although many others of the tribe, more especially among the Baboons, have the same remarkable absence of colouring matter in the skin of their upper eyelids, yet in none (excepting only in the following species) has it a hue so perfectly dead-white or so strongly contrasted with the colour of the face. The latter was formerly regarded as a mere variety of the present; but the distinctions between them appear to be permanent and are quite sufficient to justify their separation.

In the animal now under consideration the head, the whole of the upper surface and sides of the body, the tail, and the outsides of the limbs, are of one uniform deep grayish black, or more properly soot-colour, becoming deep black on the lower part of the legs and on the hands. On the under part of the moustaches, which are bushy, spreading and directed backwards, the fore part of the chest, the under surface of the body, and the inside of the limbs, the general colour is of a light gray with only a slight mixture of a dusky hue. The fingers are long and slender; the ears rather small and blackish; and the whole face livid, with a blacker tinge round the eyes, and on the nose, lips, and chin. The tail is thick and cylindrical, scarcely tapering towards the point, and generally turned backwards over the body, which it exceeds in length.

This species is not destitute of intelligence, and is easily taught to perform a variety of antic tricks, to the effect of which the peculiar expression of its physiognomy greatly contributes. It is generally good-tempered, and tolerably well-behaved, although not without its fair share of petulance and caprice. Our specimen is remarkably active, and exhibits its grimaces with laudable perseverance and unwearied zeal.



THE COLLARED WHITE EYELID MONKEY.

CERCOCEBUS ÆTHIOPS. GEOFF.

THE Collared differs from the Common White Eyelid Monkey principally in the deep chestnut brown of the upper surface of its head, and in the collar of pure white crossing the fore part of its neck and including the large bushy moustaches which extend forwards upon the cheeks and pass backwards beneath and behind the ears. The rest of the upper surface of the body is of the same slaty or soot-coloured hue as that of the former; the hands, face, and ears have nearly the same tinge; and the under surface is equally of a light ashy gray. Its form and proportions are similar, except that it is somewhat smaller. The legs are equally slender, and the tail equally long and thick. The hair which covers the body is also, as in the preceding species, long and soft to the touch. A re-

markable character in the dentition of both, rendered particularly obvious by the taste for grinning in which these animals are so prone to indulge, consists in the great breadth of the two middle incisors of the upper jaw. It is this character, which, together with the prominence of their canine teeth, produces that greater extension of muzzle on which their generic distinction has been chiefly founded.

The present species seems, from its name, to have been regarded by naturalists as peculiarly a native of the East of Africa; and Hasselquist, who, it is but fair to presume, was well acquainted with the animals described by his great master Linnæus, mentions it in his Travels as being found in Ethiopia, whence it was brought to Egypt. It would seem, however, that it is more usually imported into Europe, in common with the last species, from the western parts of that still very imperfectly investigated continent. Our specimen is in manners very like the foregoing, but is more quiet and less inclined to display its agility or its talent for making faces.





THE ENTELLUS MONKEY.

SEMNOPITHECUS ENTELLUS. F. Cuv.

ALTHOUGH there is reason to believe that this is one of the most common Monkeys both of the Peninsula of Hindoostan and of the Islands of the Indian Archipelago, we are not aware that any other specimen than that which was lately exhibited in the Society's Gardens had previously been brought alive to this country. A stuffed skin, but of a much smaller individual, in the Museum in Bruton Street, was also, we believe, unique in England. On the continent of Europe specimens appear to be almost equally rare. The species was first made known by M. Dufresne, in 1797, from a skin in his possession, which was shortly afterwards figured by Audebert in his large work on the Monkeys, whence it was adopted by later zoologists. After an interval of more than twenty years the arrival of a living individual, of small

size and immature age, at the Jardin du Roi in Paris, enabled M. Frédéric Cuvier to publish a second original figure, more valuable than the first as having been taken from the life. The same naturalist has subsequently given a still more striking and characteristic likeness of the adult animal, taken from a drawing sent from India by M. Duvaucel. These figures and the observations which accompany them constitute the sum of all that has hitherto been known to science respecting this very remarkable and interesting species.

But it seems to have escaped the observation of naturalists that the animal in question had been most accurately described as a native of Ceylon by Thunberg in his travels in Europe, Asia, and Africa, published in Swedish at Upsal in 1793, and almost immediately afterwards translated into German and English. It is true that he has confounded it with the Wanderoo, figured at page twenty-one of the present work ; but this error extends no farther than the assumption of the name of that species, which he cites doubtfully, and with which his description has scarcely any features in common. The country name by which he designates it, that of Rollewai, appears more certainly to belong to it ; for the same appellation is used by Wolf in his account of his residence in Ceylon, first printed at Berlin in 1782, and afterwards in English at London in 1785, and is evidently applied to the same species. Its coincidence with the name given by Allamand to the Diana appears to have misled the editor of the latter work ; but the descriptions both of Thunberg and Wolf differ so completely from that species, which is known to be a native of the Western coast of Africa, that there can be no risk of their being regarded as the same by any scientific naturalist. The name of Rolo-way, as applied to the Diana, must either be a purely

accidental resemblance to that of the Ceylonese animal; or, which is the more probable conjecture, must have been transferred from it to the African, by the ignorance or carelessness of the showman from whom M. Allamand received it. The similarity of sound, connected with absolute identity both of locality and habits, would tempt us also to associate with the present species the Rillowes of Knox's Historical Relation of the Island of Ceylon, were it not that there are some points in his description of those animals which could scarcely be reconciled with such a combination. It is more than probable that many of the earlier accounts of the large gray Monkeys of Bengal and the Malabar coast, which are spoken of by travellers as objects of veneration to the natives, and which have been usually referred to the Malbrouck of Buffon, are in reality applicable to the animal now before us. The Malbrouck, there is every reason to believe, does not inhabit India, but is, like all the other Cercopithecæ, a native of Africa.

The genus *Semnopithecus* of M. F. Cuvier, of which the Entellus offers a truly characteristic example, is distinguished from the other Monkeys of the Old World by several remarkable characters, affecting not only its outward form but also some essential parts of its internal organization. In the degree of their intelligence, the form of their heads, and the general outline of their proportions, the species which compose it seem to occupy an intermediate station between two other purely Asiatic groups, the Gibbons of Buffon, which are the *Hylobates* of modern systematists, and the Macaques, of which the Wanderoo may be regarded as the type. Their bodies are slightly made; their limbs long and slender; their tails of great length considerably exceeding that of the body; their callo-

sities of small size; and their cheek-pouches, in those species which appear to possess them, so inconsiderable as scarcely to deserve the name. The character, however, which at once distinguishes them from the *Cercopithec*i, is found in their dentition, and more particularly in the form of the crown of the last molar tooth of the lower jaw, which, instead of four tubercles, one at each angle of the tooth as in the latter genus, offers five such projections on its surface, the additional one occupying the middle line of the tooth, and being placed posteriorly to the rest. The Gibbons and the Macaques are also furnished with this additional tubercle.

In the shape of their heads, and the expression of their physiognomy, the *Semnopithec*i bear so close a resemblance to the Gibbons, that it would be difficult to decide from an inspection of the head alone to which of the groups any particular species ought to be referred. In the earlier stages of their growth the forehead is broad and elevated, the cavity of the cranium proportionally large, and the muzzle but slightly prominent. But as they advance in age the forehead gradually diminishes in size, contracting in a remarkable degree the dimensions of the cavity within, and the muzzle is prolonged to a considerable extent. These changes, which are common to the whole tribe, but are peculiarly striking in the present genus in consequence of the prominence of their foreheads in the young state, are accompanied by a corresponding change in the habits of the animals. When taken at an early age they are readily tamed, become playful and familiar, are extremely agile, although generally calm and circumspect in their motions, and learn to perform a variety of tricks, which they execute with no little cunning and address. After a time, however, their playfulness wears off; their confidence is succeeded by mistrust; their

agility settles down into a listless apathy ; and instead of resorting as before to the resources of their ingenuity for carrying any particular point, they have recourse to the brute force which they have acquired in its stead. At length they become as mischievous, and sometimes even as dangerous, as any of those Monkeys which in their young state offer no such indications of good temper and intelligence.

The Entellus is too distinct a species to be confounded with any other. It is of a uniform ashy-gray on the upper parts, becoming darker on the tail, which is grayish brown, of equal thickness throughout, and terminated by a few long hairs running out into a kind of point, but not forming a tuft. The under surface of the body is of a dingy yellowish white ; and the fore arms, hands, and feet are of a dusky black. The fingers of both extremities are very long, and the thumbs comparatively short. The face, which is black with somewhat of a violet tinge, is surmounted above the eyebrows by a line of long stiff black hairs, which project forwards and slightly upwards. On the sides of the cheeks and beneath the chin it is margined by a beard of grayish white passing along the line of the jaws and extending upwards in front of the ears, which are large and prominent, and of the same colour with the face. The hairs of the fore part of the head appear to diverge from a common centre. The height of our specimen, which was not yet adult, when in a sitting posture exceeded two feet ; and his tail, which he rarely displayed at its full length, but more usually kept curled up in a single coil, measured nearly three.

Both Thunberg and Wolf have given very particular and amusing accounts of the habits of these animals in their native country, where it appears that they are not uncommonly to be met with tame in the houses of the

inhabitants, in which they are also, even in their wild state, if not welcome, at least frequent visitors. The details furnished by the latter author are, however, too manifestly apocryphal to be received as authentic in the present state of science. It seems nevertheless certain that such is the respect in which they are held by the natives that, whatever ravages they may commit, the latter dare not venture to destroy them, and only endeavour to scare them away by their cries. Emboldened by this impunity the Monkeys come down from the woods in large herds, and take possession of the produce of the husbandman's toil with as little ceremony as though it had been collected for their use; for, with a degree of taste which does them credit, they prefer the cultivated fruits of the orchard to the wild ones of their native forests. Figs, cocoa-nuts, apples, pears, and even cabbages and potatoes form their favourite spoil. The numbers in which they assemble render it impossible for the sufferer to drive them away without some more efficient means than he is willing to employ: he is consequently compelled to remain a quiet spectator of the devastation, and to submit without repining to his fate.

These Monkeys appear to be peculiarly susceptible of change of climate. M. Thunberg's specimen died of cold even in the temperate latitude of the Cape; and neither the Paris specimen nor our own long survived their arrival in Europe.



THE LEOPARD.

FELIS LEOPARDUS. LINN.

THE distinctive peculiarities, as well as the general designation, of the Carnivorous tribes of Quadrupeds, are indicative of their propensity to rapine ; in other words, of that instinct which teaches them to prey upon the flesh of animals as their natural and most congenial food. We are consequently led to expect that the most highly organized and typical groups of that extensive order should exhibit this characteristic propensity in its utmost state of developement, and should be furnished with the most powerful means of carrying it into complete effect. Accordingly we find that in the genus *Felis*, which comprehends the largest and the most ferocious of predatory beasts, the teeth and claws, the principal organs of destruction, are eminently fitted for the deadly purpose to which they are applied, and are

accompanied by a corresponding developement of those accessory organs which assist them in their action.

The dentary system of the animals of this group consists of six small and nearly equal incisors in each jaw, disposed in an almost straight line in front of the mouth; of two canines bounding the series of incisors, those of the upper jaw of great length, strong, conical, sharp-pointed, slightly incurved, passing, as in all carnivorous beasts, when the mouth is closed, behind those of the lower, which scarcely differ from them in form, but are somewhat inferior in size and power; and of cheek-teeth, which require a more particular description. These are four in number in the upper jaw, and generally three in the lower; the two anterior in both series are smaller than the third, and furnished each with a single, somewhat conical, pointed, central process; the third in the lower forms two, and in the upper three, sharp-pointed lobes, with an additional internal tubercle in the latter; and the fourth, which is peculiar to the upper jaw and is placed within the posterior margin of the third, offers nothing more than a small transverse tubercle. The series is not absolutely uninterrupted, a vacancy being left between the two somewhat larger lateral incisors of the upper jaw and the canines for the reception of the canines of the lower jaw, and the cheek-teeth being seldom placed in close apposition with each other or with the canines. The slightest inspection of these organs, and more especially of the canine and of the larger cheek-teeth (the latter of which may be denominated lacerators, a term equivalent to the French designation of *carnassiers*), is sufficient to prove that nothing can be better adapted to the purpose of tearing asunder the large masses of flesh which are swallowed by these animals without being subjected to the process of mastication, which their structure and

the nature of the food renders at once unnecessary and impracticable.

To assist in the laceration of their food, the tongues of the Cats are armed, especially towards the hinder part, with numerous close-set bristly or rather prickly papillæ, the points of which are directed backwards; and their palates offer a series of transverse ridges covered with rough and projecting tubercles. The opening of the mouth is of great extent in proportion to the size of the animals; a fact which is frequently illustrated in a striking manner in travelling exhibitions, the keepers of which are in the habit of thrusting their heads into the Lions' mouths, to the no small amusement of some, and the almost equal terror of others, among the gaping spectators. The muscles which move the lower jaw are also of great bulk, and the point on which they immediately act is brought so far forwards, in consequence of the breadth and shortness of the muzzle, as to give them the highest degree of attainable force.

The claws of all the genuine species of *Felis* are of considerable length, much curved, with sharp cutting edges, and finely pointed extremities. The edge and point of these destructive organs is preserved unimpaired by a particular provision, which enables them to be entirely withdrawn within sheaths appropriated for the purpose, enclosed within folds of the skin which covers the extremity of the toes. These are five in number on the fore feet and four on the hind; and are remarkably short and obtuse. Their under surface is furnished with several distinct callous tubercles, on which the animal rests in progression, no other part of the feet being applied to the ground. The Cats are consequently truly and typically digitigrade; they possess no sole, and the part which corresponds with the

heels of the majority of quadrupeds occupies in them a conspicuous station on the posterior part of their limbs, considerably above the tubercles at the base of the toes on which alone they tread. Their legs are short and muscular; and their joints rounded, supple, and in the highest degree flexible.

In the general outline of their form the Cats exhibit a remarkable uniformity. They are all distinguished by the elongated, but not particularly slender, make of their bodies, which are much flattened on the sides; by their short thick necks, taking for the most part a nearly horizontal direction; and by the broad and rounded form of their heads, which are usually much larger in proportion in the males than in the females. Their hair is close, soft, generally smooth, and often beautifully sleek. Its colour is rarely uniform; the far greater number of the species having a tendency to assume a striped or spotted livery, which frequently exhibits such rich and varied markings as to render their furs extremely valuable. The tips of the ears in some of the species, and the extremity of the tail in others, are surmounted by pencils or tufts of longer and differently coloured hairs; but these are wanting in the majority. Their moustaches are generally of great length, and composed of numerous bristles, which appear to be of considerable use to these animals, the sense of feeling being concentrated in them, or rather in the nerves which communicate with them, in a remarkable degree. The removal of these appendages is consequently observed to produce, for a time at least, no little embarrassment. The tails of the different species vary greatly in proportionate length; they are, however, always cylindrical, and covered uniformly with hair of the same kind as that which invests the body.

In intellectual character these animals occupy a very

inferior station; and fortunate it is that such is the case. Were it not for that degradation in their mental faculties, which renders them incapable of employing their physical powers in concert with each other, what ravages would they not be enabled to commit? What could resist their prodigious and destructive force, if that force were accompanied by the sagacity of the dog or even of the wolf? But it has been wisely provided that in the same proportion as these beasts advance in the accumulation of corporeal means of destruction, they should recede in those intellectual qualifications which might otherwise be made the means of devastating the creation, while they are the less necessary for their individual preservation.

Conscious of their own undisputed superiority which secures them against the attacks of other animals, they never associate together in troops, but each with his female partner occupies a solitary den, which is usually concealed in the depths of the forest. Hence, when pressed by hunger, they issue forth in search of their prey, which they rarely attack with open force; but stealing on with noiseless tread, or stationing themselves in ambush in such situations as appear suitable to their purpose, watch with indefatigable patience the approach of their victim. Their motions are peculiarly characteristic of their habits and mode of life. Incapable of long continued speed, their usual gait is slow, cautious, and stealthy, with their posterior limbs bent beneath them, and their ears distended to catch the most trifling noise. Guided by these organs, the internal structure of which is highly developed, they trace the sound of footsteps at an almost incredible distance, and direct themselves towards their prey with unerring certainty. In this quest the sense of smell, which they possess in a very low degree, affords them but little

assistance ; their sight, however, is good, and serves them equally well both by day and night, their extremely dilatable pupils adapting themselves with admirable precision to various intensities of light. To this object the frequently elongated form of their pupils, the generally yellow colour of the internal or choroid coat of their eyes, and the extent of their nictitating membranes must also essentially contribute.

No sooner is the object of their pursuit within reach of their attack, than suddenly bursting forth from their lurking place, or changing their slow and stealthy pace for a furious and overwhelming bound, they dart with the velocity of lightning upon their terrified victim. The great strength and extreme flexibility of their fore paws enable them at once to dash him to the earth, and to seize him with an irresistible grasp. They then proceed to rend him in pieces by the united efforts of their teeth and claws, and gorge themselves upon his lacerated flesh. It is only when fearful of being disturbed in their operations that they carry off the body from the spot where it has fallen ; and even in such cases they never transfer it to their dens, but seek out some solitary place in which to glut their ravenous cravings. When satiated they quit the carcase, to which they never return, and retire to their dens to sleep off the effects of their gluttonous meal ; not again to awake until their renovated appetite stimulates to a repetition of the murderous scene. Even their amours are accompanied with a degree of savage barbarity ; and the female is not unfrequently called upon to protect their mutual offspring from the ravenous jaws of her male companion.

Next to their ferocity, the leading feature in the moral character of all the Cats is suspicion. It is this which imparts, even to the largest and most powerful

of the group, an air of wiliness and malignity, but ill assorting with their gigantic size and immense muscular power. Of this feeling they can never be entirely divested; it is sufficiently remarkable even in the domesticated race; but becomes still more obvious in those which are kept in a state of confinement, and which, however well they may appear reconciled to their condition, and how much soever they may seem attached to their keepers, are startled by the slightest unusual occurrence, and become restless, uneasy, and mistrustful, whenever any change, however trifling, takes place in the objects by which they are surrounded.

Such are some of the most striking characteristics, both physical and moral, which are common to the whole group. The Leopard, which may fairly be regarded as one of its most typical species, partakes in a high degree of all these general attributes of his tribe. It is therefore unnecessary to enter into any more particular detail with respect to his disposition and habits, which offer little that is peculiar to himself. Yet even among the Cats he is remarkable for extreme sleekness and excessive agility. He is well distinguished from all the other species by the vividness of his colouring and the beauty of his markings. These consist of numerous rows of large open rose-like spots passing along his sides, each formed of the confluence of several smaller black spots into an irregular circle enclosing a fawn-coloured centre upon a general ground colour of lighter yellow. On his head, neck, and limbs, and the central line of his back, the spots run into one another so completely as to form full patches of smaller size than the open roses, and without central yellow. The under parts of his body, as is usual in most quadrupeds, become gradually of a lighter hue, the throat, chest, and abdomen being of a pure and delicate white. His tail is

equal in length to the entire body excluding the head ; and is marked by a continuation of the open roses of the sides, which become towards its extremity separated in such a manner as to surround the upper surface with partial rings of black alternating with white. The whiskers are long and white, and implanted in a series of black lines which traverse his lips. He usually measures about three feet in length, exclusive of his tail.

The Leopard is a native of Southern Asia, and of nearly the whole of Africa, inhabiting the woods, and preying chiefly on antelopes, monkeys, and the smaller quadrupeds. It climbs with the greatest facility.

The variety figured is remarkable for the irregularity of its spots, which, although they exhibit the usual tendency to unite into somewhat circular roses, are much more broken than is usual in the species, and have their centres occasionally marked by one or two smaller spots like those which are uniformly met with in the Jaguar. It is on account of this curious deviation from the typical marking that we have selected it for representation from among the numerous specimens contained in the Society's collection.





THE JAGUAR.

FELIS ONÇA. LINN.

WHETHER the Leopard and the Panther are in reality distinct species, and if so on what particular characters the specific distinction depends, are questions that have been so variously solved by writers of the highest eminence that we cannot, without better opportunities for comparison of specimens than we at present possess, adopt the conclusions to which any one of them has come upon the subject. Linnæus, not perceiving any sufficient grounds of distinction, referred both names to one and the same animal; Buffon added a third, that of the Ounce, and increased the confusion by describing, as the Panther of the ancients and an animal of the Old Continent, the Jaguar which is now known to be peculiar to the New; Cuvier subsequently founded a distinction upon the greater or smaller number of

rows of spots disposed along the sides of the body ; and Temminck, rejecting these characters as unimportant, has lately fixed upon the comparative length of the tail as affording the only sure means of discrimination. In this uncertainty the question remains for the present : but there can be no doubt of the complete distinction between both the animals involved in it and that which we have here figured, the mistaken Panther of Buffon, the Jaguar of Brasil, and *Felis Onça* of systematic writers. It may not, however, be useless to observe that of the figures given by Buffon as Panthers and Jaguars, that which is entitled the male Panther is in all probability a Leopard ; the female is unquestionably a Jaguar ; the Jaguars, both of the original work and of the Supplement, are either Ocelots or Chatis ; and that which purports to be the Jaguar or Leopard, although probably intended for a Chetah, is not clearly referable by its form and markings to any known species.

The differences between the Leopard of the Old Continent and the Jaguar of the New were well known to Linnæus, who has indicated them with his usual precision in the specific characters and accompanying descriptions given in his *Systema*. But later naturalists appear to have passed them over, until M. Geoffroy again recognised them, with the assistance of M. D'Azara, about the commencement of the present century, in the animals of the Paris Menagerie. Since this period they have been verified upon so large a number of living specimens, and upon so many thousands of skins, that there can be no doubt either of the permanence of the characters or of their importance as discriminating marks.

The form of the Jaguar is much more robust, and even to a certain extent more clumsy, than that of the Leopard. When full grown he is also far superior in

size, frequently measuring from four to five feet from the nose to the root of the tail. His body is thicker, his limbs shorter and more muscular, and his tail, instead of being fully as long as the body exclusive of the head, scarcely trails its tip upon the ground when the animal is in an erect position. His head is also considerably larger, and at the same time somewhat shorter in proportion, than that of the Leopard; and the line of his profile is more prominent above the eyes. These differences of form are accompanied by differences in colour and markings equally decisive. The general appearance is at the first glance the same in both; but the open roses of the Leopard are scarcely more than half the size of those of the Jaguar, and they all enclose a space of one uniform colour, in which, unless in some rare and accidental instances, no central spots exist, while in the latter animal most of those which are arranged along the upper surface near the middle line of the back are distinguished by one or two small black spots enclosed within their circuit. The middle line itself is occupied in the Leopard by open roses intermixed with a few black spots of small size and roundish form; that of the Jaguar on the contrary is marked by one or two regular longitudinal lines of broad elongated deep black patches, sometimes extending several inches in length, and occasionally forming an almost continuous band from between the shoulders to the tail. The black rings towards the tip of the latter are also more completely circular than in the Leopard. These differences may perhaps appear minute upon paper, but they are strongly marked in the animal itself; and their minuteness is fully compensated by the facility with which they may be detected, both in the living individual and upon his fur after death.

The Jaguar is the largest and most formidable among

the Cats of the New World, in the warmer regions of which he exercises the same cruel tyranny as the Lions, the Tigers, and the Leopards, of the burning climates of the Old. He appears to be almost universally spread over the southern division of the American continent from Paraguay to Guiana ; but there is no satisfactory proof of his having been observed to the north of the Isthmus of Panama. In the neighbourhood of inhabited places he is daily becoming more and more rare, the ravages which he commits upon the flocks, and the high price that is given for his skin, forming a double incentive to his destruction. His habits and manners are almost precisely the same as those of the other large animals of his tribe ; but he is spoken of as even more indolent and cowardly. Like them he generally watches for his prey in a concealed ambush, whence he darts upon it unawares, bearing it at once to the earth by his great muscular strength, and depriving it of all power of resistance or of flight. Occasionally, however, when urged by hunger, he prowls abroad more openly, and will even venture to attack man ; but rarely if he finds him on his guard. M. Sonnini relates that one annoyed him and his party for two successive nights, during his travels in Guiana, constantly hovering about them, watching an opportunity for falling on his prey, but retreating into the bushes the moment he perceived himself observed, and disappearing with such rapidity that it was impossible to get a shot at him. According to the same author and to M. D'Azara, these animals climb with great dexterity, swim with almost equal skill, and are able to carry off the bodies of their victims, even of the largest quadrupeds, such as horses and oxen, to a place of security where they can satiate their appetites without risk of disturbance.



THE BROWN BEAR.

URSUS ARCTOS. LINN.

PASSING by an abrupt transition from the most typical group of the Carnivora to that which exhibits the essential characters of the order in their lowest state of developement, we next turn our attention to the Bears. In these animals, which we are enabled to connect with the Cats by the intervention of a series of modifications forming an almost unbroken chain, we find the raptorial character so greatly diminished as no longer to form a prominent feature in their organization, physical or moral. The teeth, and more especially the grinders, have lost their cutting edges and sharp points, and are very nearly reduced to the structure of the same organs in the Monkeys and other omnivorous

creatures; the claws are destitute of retractility, blunt at the edges, and calculated more for climbing trees and burrowing in the earth than for the purposes of prehension or destruction; and all the other organs are in a like manner modified in conformity with the change of character of which these differences form the certain indications. We look in vain among the Bears for the sleekness and agility of the Cats, the swiftness and intelligence of the Dogs, or the insinuating slenderness of the Weasels; but in the place of all these we find great clumsiness of form combined with a high degree of brute force, much intellectual stupidity, and an insatiable and gluttonous voracity.

The incisor teeth of the Bears, six in number in each jaw, afford the only means which they possess of lacerating animal food; and for this purpose they are but ill calculated. The two outer of the upper jaw are strong, pointed, and placed somewhat obliquely with respect to the others, the cutting edges of which have also a tendency to become pointed. In the under jaw the two outer are broader than the rest, and have each a lateral lobe at their base externally; the second on either side is placed more internally with respect to the mouth; and the intermediate ones are the smallest of the series. The canines of both jaws are strong, conical, and incurved. In the number of the cheek-teeth there is some variation, dependent chiefly upon age; but the most usual amount appears to be five in the upper jaw and six in the lower. Of these three in the upper and four in the lower may be regarded as true molars, and are universally found; the others, which are small and conical, seldom remain permanently fixed in their sockets, but fall out as the animal advances in age. It is most common in young Bears to find two of these in each jaw, one placed at the base of the canine, and the

other immediately anterior to the first molar, with a vacant space between them; which space is, however, sometimes occupied by a third intervening tooth similar in character to those between which it is protruded. The crowns of all the molars are flattened, and surmounted by tubercles of the same description as those which exist upon the human grinders. They are consequently fitted almost solely for the detrition of vegetable substances, which form in fact the largest share of the food of these animals. So completely is the carnivorous character lost in their teeth, that it would be impossible, without the transition afforded by the Racoons and the Coatis, and carried on through the Dogs and the Civets, to recognise the lacerators of the Cats in the penultimate molars of the Bears. Their purpose is no longer the same, and their form is consequently changed for one more adapted to the habits of the group.

The thickset and clumsy figure of the Bears is produced not only by their great muscularity, but also by their tendency to accumulate fat, and by the shagginess of their external covering, which in most of the species is long, rough, and woolly. Its effect is moreover heightened by the comparative shortness of their limbs, and the large portion of both extremities which is applied to the surface of the ground, their walk being completely plantigrade, and the soles of all the feet forming broad callous expansions. They have five toes on each foot terminated by strong curved unretractile claws. The form of their heads is for the most part nearly round, with a broad projecting muzzle, having its extremity perforated by the large fissured nostrils, which together with the lips are extremely moveable and capable of considerable protrusion. The tongue is perfectly smooth and very extensible. The ears are of

moderate size; and the pupils of the eyes circular. The tail is so small as to be scarcely visible among the long hairs by which it is surrounded.

Before proceeding to describe the Brown Bear, which forms the subject of the present article, it may not be amiss to take a glance at the history of the genus of which it is the type, for the purpose of showing how greatly zoological science has advanced within the last half century. A single species, that which is about to engage our more particular attention, was known to the great systematist of nature; and it was not until the tenth edition of his immortal work that he ventured even to question whether the White Bear of the polar regions, which he had never seen, might not be in reality distinct. Pallas converted this doubt into a certainty, and added a third species in the Black Bear of America. In 1788 a draughtsman of the name of Catton published the figure of a remarkable animal, which he called the Petre Bear, but which the more scientific naturalists of the day perverted into a Sloth. This was the first Indian species known; and to it Sir Stamford Raffles added a second, M. Duvaucel a third, and Dr. Horsfield a fourth. A second American species, the Grisly Bear, which had been repeatedly noticed by travellers, was zoologically described by Messrs. Say and Ord. Baron Cuvier has also described as distinct the Black Bear of Europe, with respect to which he nevertheless appears latterly to have entertained some doubt; his brother, M. Frédéric Cuvier, has figured no less than three individuals of races apparently differing from those previously known, brought respectively from the Pyrenees, Siberia, and the Cordilleras of the Andes; and Dr. Horsfield has given a notice of a species from Nepaul agreeing more closely in habit with the European Bear than with those of

India. From this enumeration it appears that instead of the solitary species known to Linnæus, there are now recognised no less than eight, while five others may be regarded as in abeyance, waiting the decision of those naturalists who may have the opportunity of further investigation. Every one of the eight allowed species has been living within the last five or six years in London. Five are at the present moment exhibited in the Society's Menagerie, two others form part of its Museum, and the eighth, the Grisly Bear of America, has been represented for nearly twenty years by a noble specimen in the Menagerie of the Tower. Such are the advances which this department of zoology has made since the days of Linnæus.

The Brown Bear was formerly an inhabitant of the whole of Europe, as far south as the Alps and the Pyrenees; but he has in modern times been completely extirpated from the British Islands, and the interior of France, Holland, and Germany. In the Alps he is still common, as well as in the mountain forests of Bohemia, Poland, and Russia. But his limits are not bounded by the geographical divisions of the continents: he is also found in great numbers in Siberia, and even as far eastwards as Kamtschatka and Japan; and is spread more sparingly over a considerable portion of the northern regions of America. In this vast extent of country it would be surprising indeed if we did not meet with some variations resulting from local circumstances; but these are generally speaking of too trivial a nature to be regarded as affording sufficient grounds for specific distinctions. Among the most remarkable we may mention a white variety, totally distinct from the Polar Bear, which is sometimes met with in high northern latitudes. The Cinnamon Bear, as it is called, appears

to be a variety of the black species, exhibiting the same tendency to albinism, but in a far inferior degree.

In his more usual condition the animal is covered with a thick coat of long, soft, woolly hair, which in the younger individuals is of a deep brown with a tinge of gray on the body, and becomes nearly black upon the legs and feet; while in the more advanced age it presents a mixture of yellowish gray and fawn-colour, giving to the fur a grizzled appearance. The forehead rises suddenly from behind the eyes, assuming a regularly convex form, but not elevated to any great extent; the muzzle is broad, prominent, and terminating in a moveable extremity, the mobility, however, being most remarkable in the upper lip, which is capable of being protruded much beyond the nostrils; and the eyes are extremely small. The usual size of the full grown animal is about four feet in length and nearly two feet and a half in height. The length of the head is about a foot; that of the fore feet eight inches; and that of the hinder feet something greater, reckoning from the heel to the extremity of the claws. The latter are fully two inches in length, considerably curved, and nearly equal on either extremity.

In his native state the Brown Bear is one of the most solitary animals in existence. Far from seeking the company of his fellows, he remains associated with his female only during a short period, and then retires to his winter retreat. This asylum is generally formed by the hollow of a tree, by a natural cavity in the earth, or by the cleft of a rock; but is sometimes entirely constructed by the animal himself from the branches of trees comfortably lined with moss. Here he continues, for the most part in a state of lethargy, abstaining altogether from food, and subsisting upon the absorption

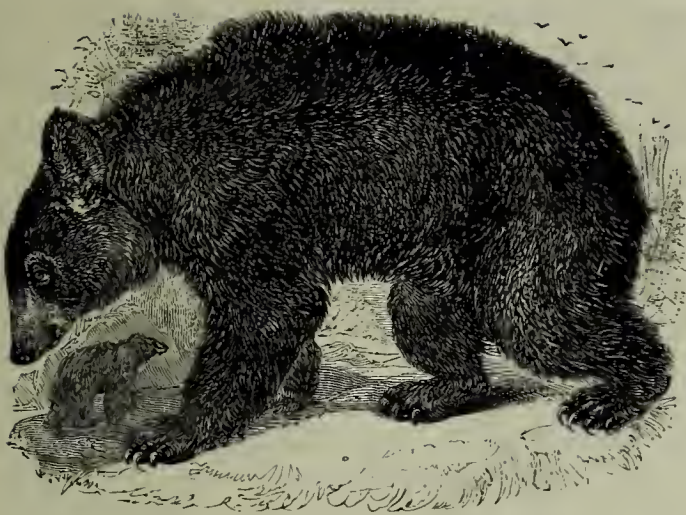
of the fat which he has accumulated in the course of the summer, from the setting in of the cold season until the return of spring. The female remains somewhat longer in her retirement than the male, and does not quit it until her young are in a condition to follow her example. It is at this period that they are the most dangerous, their hunger tempting them to make prey of whatever may fall in their way. At other times they prefer fruits, roots, and other vegetable productions, to the uncertain supply which they derive from the capture of the smaller, and especially the burrowing, quadrupeds. They never attack man unless provoked; but when irritated they are formidable enemies to encounter. In such cases they usually raise themselves upon their hind feet, and endeavour to engage and squeeze their opponent between their fore legs, which are excessively powerful. Notwithstanding the clumsiness of their form they climb trees with great readiness, and swim with almost equal skill. In captivity they are sometimes taught to exhibit their awkward figures in a variety of forced and ludicrous attitudes.

They sometimes attain a considerable age. In the pits of Berne, where it has been the fashion for many centuries to keep some of these animals, "for name's sake," at the public expense, a pair were living in 1771 which had been confined there for one and thirty years. Another individual, which was born in the same pits, was living at the commencement of the present century in the Ménagerie of the Jardin des Plantes at Paris, at the age of forty-seven. In both these establishments their only food consisted of bread, occasionally varied by the introduction of fruits and vegetables. At Berne in particular, by a regulation of the police, all the unripe fruit that was brought to market was ordered to be given to the bears. They were never allowed to

taste of flesh ; and their thriving condition proved that such an addition to their usual diet was perfectly unnecessary to the maintenance of their health.

The Brown Bears now in the Society's pit afford an excellent illustration of the differences between the young and the adult animal. The deeper coloured of the two is not yet three years old, having been presented to the Society when very young by the Marquess of Hertford, who brought him from Russia. The other, which was presented by the Rev. E. Edgell, is stated to be a native of America. It resembles the adult Alpine Bear so closely in its form, in its fur, in its physiognomy, and in its manners, that we have little hesitation in referring it to the same species. Notwithstanding the wide difference in geographical position we see no incongruity in such a union ; on the contrary it would strike us as a very peculiar and surprising fact that so excellent a swimmer and so essentially migratory a beast as the Brown Bear should present almost a solitary exception to the general rule which renders most of the animals inhabiting the arctic circle common to the two continents.





THE AMERICAN BLACK BEAR.

URSUS AMERICANUS. PALLAS.

ALTHOUGH naturalists were long in a state of uncertainty with respect to the propriety of separating the Black Bear of America from the common species, it is obvious that their doubts could only have arisen from the want of sufficient materials for comparison. Whoever has seen the two animals together will at once admit that they belong to species perfectly distinct, so greatly do they differ from each other in figure, in fur, in colour, and even in their gait, attitudes, and manners. The head of the American is narrower, with much more of the physiognomy of the Dog; the distance between the ears is proportionally greater; the forehead is more regularly convex, but not quite so much elevated, the line of the profile being continued without any depression above the eyes, and the muzzle is more prominent

and pointed. The general proportions of the body and limbs are also smaller; and the whole are covered with soft smooth straight hairs of a deep glossy black throughout the greater part of their length, having none of the shagginess or woolliness which characterizes the fur of the Brown Bear, and without any intermixture of the lighter-coloured hairs by which the coat of the latter is always more or less grizzled. The muzzle alone is covered with short close-set hairs of a deep brown above and somewhat lighter on the sides. The tail is more distinctly visible in consequence of the greater smoothness and regularity of the fur; the feet are smaller in all their dimensions; and the claws have a somewhat greater curve, appear to terminate in sharper points, and are almost buried in the hair.

The American Bear advances far into the north, and is so abundant in Canada and the neighbouring countries as to constitute a considerable branch of the fur trade which is there carried on. In the year 1783 no fewer than ten thousand five hundred bear-skins were imported into England from the northern parts of America, and the number gradually increased until 1803, when it had reached twenty-five thousand, the average value of each skin being estimated at forty shillings. The supply appears subsequently to have been greatly diminished, partly perhaps in consequence of the wholesale manner in which the destruction of the animal had been carried on, and partly in consequence of the preference given to the finer kinds of fur. From Canada these Bears extend southwards through most of the uncultivated or thinly peopled districts as far as the Isthmus of Panama. They were formerly common in New York, Louisiana, Carolina, and even Florida; but the progress of civilization has nearly extirpated them from the immediate vicinity of man, and driven them to

seek an asylum on the Rocky Mountains and in the extensive forests of the interior. They are still numerous on the western coast as far south as California. Bears are also found in Peru; but it is not yet satisfactorily ascertained whether or not they constitute a distinct species from that which is so extensively dispersed over the northern division of the American continent.

The habits of the American Bear are almost precisely similar to those of the European. The American is, however, upon the whole, somewhat less carnivorous. His food in a state of nature consists chiefly of wild fruits and other vegetable productions; and he rarely attacks the smaller quadrupeds unless compelled by positive hunger. Occasionally, we are told, he makes considerable havoc among the pigs which are suffered to roam at large in the forests; and he has even been known to devour calves and sheep. In no instance, however, has he been fairly convicted of making the first attack upon a man, although when irritated, or rendered desperate by his wounds, he will frequently turn upon his pursuers and defend himself with all the natural ferocity of his disposition. He is said to be particularly fond of fish, especially herrings, and to be very dexterous and expert in fishing, "catching," says Brickell in his *Natural History of North Carolina*, "vast quantities of several sorts of fish, as they run up the creeks and shallow waters to spawn. There," he continues, "you shall see these beasts sit, and take up fish as fast as it is possible for them to dip their paws into the water." Honey is also as great a favourite with them as with the Bears of Europe. They climb trees with at least equal dexterity, and swim across the broadest rivers with as much ease as the Polar Bear himself.

The period of their hybernation corresponds with the setting in of the frost. In the more northern latitudes they dig themselves holes in the ice or in the snow, where they remain until the return of spring. But in situations where the cold is less intense the males usually migrate towards the south, in search of food ; and frequently, if this is readily procured, roam at large during the entire winter. The pregnant females, however, always conceal themselves ; and this affords a satisfactory solution of the remarkable fact that, to use the expression of Brickell, "no man, either Christian or Indian, ever killed a She-Bear with young." So true is this, as a general observation, that Dr. Richardson assures us that, "after numerous inquiries among the Indians of Hudson's Bay, only one was found who had killed a pregnant Bear." In the more southern districts they usually prefer the trunks of hollow trees for their winter habitations, which they not unfrequently construct at the height of thirty or forty feet from the ground.

The flesh of Bears which have fed much upon fish is regarded as tainted and unfit for use ; otherwise they are reckoned very good eating. Their tongues and paws are considered the most delicate parts ; and the hams made from them are said to be not inferior to those of Westphalia. Their fat is also in great request, especially among the Esquimaux and the Canadian Voyageurs, who devour it in large quantities. The fur is less sought after than formerly as an article of commerce ; but is still used very extensively by the inhabitants of the more northern regions, for whom it forms the most essential article of clothing during the severity of an arctic winter.



THE CUBAN MASTIFF.

CANIS FAMILIARIS. Var.

THIS fine pair of Dogs, which were presented to the Society by Captain Marryatt, who obtained them from Cuba, partake of the characters of the Spanish Bull-dog and English Mastiff, and seem to be completely intermediate in form between the two. They are larger than our common Bull-dogs and smaller than the Mastiff, well made and rather stout in their proportions, moderately high upon their legs, muscular, and powerful. Their muzzle is short, broad, and abruptly truncate at the extremity, with somewhat of an upward curve; the head broad and flat, and the lips elongated and so deeply pendulous as to overlap the margins of the lower jaw. The ears, which are of a middling size, are also partly pendulous, but not to such an extent as to lie flat upon the sides of the head. The tail is rather short,

cylindrical, and turned upwards and forwards towards the tip. Their hair is throughout short, close, and even. On the upper parts it is of a bright brown, becoming somewhat paler beneath. The muzzle, lips, ears, both within and without, and a patch surrounding each of the eyes, are of a dusky black.

Notwithstanding the apparent capacity of their cranium, the Dogs of this tribe are by no means remarkable for their intelligence. They are, however, eminently faithful, and as courageous as they are powerful. They are consequently chosen in preference to all others for house-guards and watch-dogs, and are also in much request, wherever such sports are encouraged, for bull-fights and other similar exhibitions of brutality. For their legitimate purposes they are a most useful race.

The Society's specimens of the Cuban Mastiff are in general, the female particularly, tolerably good tempered, but they will not bear provocation. The female produced a litter of puppies in the early part of the summer.





THE AMERICAN BISON.

Bos AMERICANUS. GMEL.

THE American Bison attains a size far superior to that of the largest breeds of our Common Oxen. Like the Polish Aurochs, the species to which it offers the nearest approach, it has a bold elevated forehead, of much greater breadth than length, and bounded above by an arched line passing across the head about two inches behind the roots of the horns. Its withers also are elevated in the form of a huge hump, extending for some distance along the back, to the level of which it gradually slopes, and giving to the fore quarters the appearance of being raised much higher than the hind: the limbs, however, are of nearly equal length. This protuberance does not consist, as in the Zebu, merely of flesh and fat, but is supported by an actual elonga-

tion of the spinous processes of the vertebræ beneath. It is covered, as well as the greater part of the head, the neck, and the shoulders, by a thick shaggy coat of long woolly hair. The rest of the body is clothed only by short close curling hair, which becomes rather woolly in the depth of winter, and falls off almost entirely in the summer, exposing the black wrinkled skin beneath. The colour of the animal is in general of a deep brown approaching to black, but darker on its hinder parts, black on the head, and lighter about the neck and shoulders. The legs are short, firm, and muscular; and the tail, which is little more than a foot in length, is nearly naked except at the tip, where it is terminated by a tuft of long black hairs. The head is so extremely large and heavy as to require a high degree of muscular force for its support; and for this purpose the great developement of the spinous processes of the dorsal vertebræ, and of the powerful muscles attached to them, appears to be admirably calculated. The eyes are small, black, and piercing. The horns are short, black, thick at their base, placed widely apart from each other, directed outwards, backwards, and upwards, and but little curved towards their tips. The female is considerably smaller than the male, her mane is much less developed, and her horns are much less strongly formed.

There is one particular in the anatomical structure of the Bison which must be regarded as decisive of its specific distinction. In the Common Ox it is well known that the number of ribs on either side is thirteen; in the Aurochs it is fourteen; and in the Bison fifteen; the supplementary ribs in the two latter animals being attached to the anterior lumbar vertebræ, which thus become dorsal in their functions. Such a variation never occurs as a permanent structure in breeds origi-

nally descended from the same common stock; and when to this we add the many points of discrepancy in outward form between the Bison and the Aurochs, with which alone it can possibly be confounded, the immense portion of the surface of the earth interposed between the habitats to which they are severally confined, and the striking dissimilarities observable in their character and habits, it is impossible not to agree with M. Cuvier in regarding the two races as originally, and therefore specifically, distinct.

These animals are met with throughout nearly the whole of the uninhabited parts of North America, from Hudson's Bay to Louisiana and the frontiers of Mexico. They are smaller in the north, and do not appear to congregate together in the immense herds which are spoken of as covering miles in extent of the vast open savannahs of the more southern districts. Modern American travellers, and particularly Captains Lewis and Clarke and Dr. James, bear frequent testimony to the almost incredible numbers in which they assemble on the banks of the Missouri. "Such was the multitude of these animals," say the former gentlemen, "that although the river, including an island over which they passed, was a mile in length, the herd stretched, as thick as they could swim, completely from one side to the other." And again, "If it be not impossible to calculate the moving multitude which darkened the whole plains, we are convinced that twenty thousand would be no exaggerated number." Dr. James tells us that "in the middle of the day countless thousands of them were seen coming in from every quarter to the stagnant pools;" their paths, as he informs us elsewhere, being "as frequent and almost as conspicuous as the roads in the most populous parts of the United States."

The American Bisons generally prefer the open plains, the long rank herbage of which affords them their principal support. They feed in the morning and evening, and indulge themselves in bathing in the marshy swamps during the heat of the day, seldom seeking the shelter of the forest unless when attacked. On these occasions they almost invariably take to flight, seldom trusting to their unwieldy strength for their defence. They are extremely fleet, and their sense of smell is so acute as to enable them to scent an enemy at a very considerable distance. They frequently however become a prey to the wolves and grisly bears ; and still more frequently to the savage tribes of Indians, who subsist almost wholly on the produce of the chase. Their beef is said to be excellent.

Our specimen, a very large male, was purchased from a showman, by whom it had been exhibited, like others of its species, under the classical name of the Bonassus, to which (any more than to that of Bison, unless accompanied by some qualifying epithet), we need hardly say, it could have no real claim. It died soon after its transfer to the Society, apparently in consequence of the sudden change operating upon a habit already enfeebled by chronic disease, and has lately been replaced by a young female, figured below, which was presented by the Hudson's Bay Company.





THE INDIAN ANTELOPE.

ANTILOPE CERVICAPRA. PALL.

It is a somewhat mortifying reflection that even in the present advanced state of zoological science we are obliged to confess ourselves unable to define, by means of any of those characters to which importance is usually attached, the exact limits of the most natural and extensive groups of which the Ruminant Order is composed. The teeth afford us little assistance, for in the great majority of these animals they are in all essential points the same ; the organs of locomotion

furnish no better grounds of distinction ; and even the horns, which are the peculiar property of the order, are subject to so much variation in closely allied species, and pass by such easy gradations from the form that is considered typical of one group to that by which the neighbouring genera are characterized, as to lose much of their *primâ facie* value for the purposes of classification. On these, however, we are in a manner compelled, by the absence of more efficient means of discrimination, to rely as the basis of all our subdivisions.

The horns of the Antelopes are for the most part perfectly simple, one or two paradoxical species alone exhibiting a single short ramification. They are sometimes common to both sexes ; but more frequently exist only in the male. Internally they are formed by an osseous protuberance of the frontal bone, generally solid in its consistence like the deciduous horns of the Stags, and destitute of cavities or cells. By this latter circumstance alone, combined with the roundness of their external contour, are the horns of some of the species to be distinguished from those of the Goats, which are always hollow within, containing pervious cavities communicating with the frontal sinuses. There is reason, however, to believe that the latter structure likewise obtains in several well marked Antelopes. The bony processes are permanently attached to the skull, and are enveloped on the outside by a sheath of horny matter, increasing by successive layers from the base in proportion to the growth of the nucleus within. This outer covering, to which the name of horn is more peculiarly appropriate, is rounded in its outline in all the genuine Antelopes, and is most commonly marked by circular elevated rings or by a continuous raised spiral line. In some few it is perfectly smooth through-

out. The direction of the horns is extremely variable : it is usually more or less ascending from the base ; but their points may be turned forwards or backwards, or to either side. In many species they are spirally twisted so as to form two or three perfect convolutions.

By means principally of the almost endless variety of modifications in form and direction to which these organs are liable, it has been proposed to subdivide the Antelopes into numerous genera ; but the groups thus produced are for the most part confessedly artificial, and have no other bond of union, and nothing to separate them from their fellows, but this one solitary character. Such an arrangement doubtless has its use in simplifying the study of a tribe so numerically extensive by the application of an easy method of analysis ; but it can have no pretensions to be regarded as forming part of a natural system, in which, it cannot be too often repeated, the genus should give rise to the character, and not the character to the genus. Acting upon this principle we cannot but treat the Antelopes, for the present at least, as a single great natural genus, artificially distributed into sections ; although some of its component parts will doubtless hereafter be found to require separation from the rest. In that case the genus itself will form a family, the limits of which will then be more accurately defined than at present, by means of the extensive researches into its natural history and economy which must be entered upon before such a subdivision can be properly attempted or satisfactorily accomplished.

The remainder of its characters are rather those of general appearance than of essential structure. The body is usually slightly and elegantly formed, and supported by long slender limbs, the anterior of which are shorter than the posterior. The line of profile in

most of the species is nearly straight, and commonly terminates in a moist naked muzzle. The latter is, however, frequently wanting, the extremity of the nose being covered with hair. Beneath the inner angle of the eyes many of them are furnished with a fissure of greater or less extent, which expands into a cavity called the suborbital sinus, and secretes a peculiar fluid, the purposes of which are not yet thoroughly understood. Their ears are rather large, upright, pointed, open, and moveable; their eyes brilliant, full, and prominent; and their tongues soft and smooth. Their hair is generally short, close, and regular; and they have very rarely a dependent beard beneath the chin. A large proportion of the species have broad tufts of long diverging hairs upon the knees. Their hoofs are usually longer, slenderer, and more acute than those of the Deer. They are chiefly natives of Africa and Southern Asia, but more especially of the former continent. Only one species, the Chamois of the Alps, is found in Western Europe; and no more than two or three, the habits and characters of which are still very imperfectly known, have hitherto been discovered in America. In manners they are gentle and peaceable, but at the same time wild and timid, and easily scared. They live, like all the other Ruminants, solely upon vegetable food; and generally congregate together in little herds or families. Most of them are exceedingly fleet, and outstrip even the Stag in the velocity of their flight.

The name of Antelope, appropriated by all the early English writers, and afterwards by Buffon, to the beautiful species figured at the head of the present article, but generically extended by Pallas to the entire group of which it forms part, is generally believed to be of fabulous origin. Although apparently of Greek formation, Bochart suspects it to have been derived from the

Coptic *Pantholops*, which, according to that writer, signifies the Unicorn. Its adoption in the languages of Europe is traced no farther back than the fourth century of the Christian era, when it was employed by Eustathius in his *Hexameron* to designate an imaginary animal, living on the banks of the Euphrates, sawing down trees with its horns, and entangling itself by the same jagged protuberances among the bushes, so as to become an easy prey to the hunters. This account of its habits was so obviously apocryphal as to induce Linnæus, in the first edition of his *System*, to place the Antelope among the fabulous and paradoxical beasts. Even in the last edition of his great work, published in 1766, he refused admission to the name; and persisted in retaining all the animals now universally distinguished as Antelopes in the same genus with the Goats. Only five species of the group are there characterized; but Pallas, in the succeeding year, increased the number to sixteen, and ten years afterwards added six more, making in all twenty-two. In his excellent *Memoirs* upon this subject the species are discriminated with judgment and precision; the synonymy is established by careful comparison; and detailed descriptions are added both of the external and internal structure of those which had fallen under his personal observation. They form the basis on which all subsequent zoologists have worked; and although the number of the species has since been more than doubled may still be regarded as models in their kind. The most active and successful of the later investigators of this difficult group have been M. de Blainville, Major Hamilton Smith, and Professor Lichtenstein. The latter gentleman has announced his intention of again revising the entire genus; and M. Temminck has also been for some time engaged in the preparation of a similar monograph; so that we

may shortly expect considerable additions to our knowledge in this interesting department.

The Indian Antelope is nearly equal in size to the Fallow-deer, which it closely resembles in form, but with some slight differences in the shape of the head. In the full grown male the whole of the back and upper parts of the sides, together with a broad band occupying the entire fore part of the neck, the outsides of the limbs, the upper surface of the tail, the ears, and a considerable portion of the head and face, are of a deep fawn colour, shaded more and more, as the animal advances in age, with an intermixture of black hairs, which are most numerous over the shoulders, on the fore legs, on the front of the neck, round the bases of the horns, and on the face where they are still deeper than on any other part. The under surface from the chest to the tip of the tail, a tuft of long hairs at the end of the latter, a broad patch on the buttocks, the insides of the limbs, the extremity of the nose, the lower lip, the chin, and a broad circle round each of the eyes, are pure white. The line of separation between the colours is distinctly marked in every part. Below each eye there is usually a small dusky spot marking the commencement of the suborbital sinus, which is of large size. A similar patch occurs at the junction of the hoofs. The latter are black, acute, much elongated, and not separable to any great extent from each other. Beneath the knees on the fore legs is a broad brush of radiating hairs. The horns, which make their appearance in the seventh month, increase rapidly in size until the third year, at which time they have completed two spiral turns, and are marked by about twelve elevated rings. After this period their growth is less rapid; but at six years old the number of convolutions is increased to three, and that of the circular rings to twenty-seven.

They are then about thirteen inches in length, closely approximated at the base, and separated at the points by an interval of a foot. At a still more advanced period they may attain sixteen, twenty, or even twenty-four inches in length; but the number of complete convolutions seldom reaches four.

The female differs from the male in the entire absence of horns. Her general colour is of a lighter fawn, and never assumes the dusky tinge of the adult male. On the fore part of the neck she is of a light ashy gray; and a grayish line passes along each side of her back from the shoulders to the rump. In other respects there is little external difference between the sexes. The young male is scarcely to be distinguished in colour from the female; but he becomes gradually darker, and the light stripes along the back gradually vanish, as he advances to maturity.

These animals appear to be common in the north of India. They associate together in small herds, which probably consist only of a single family, and are under the guidance of an old male. They are extremely shy and timid; and are not easily to be run down, on account of their surpassing velocity and the great length of their bounds, by means of which they distance the fleetest dogs. They are sometimes, however, surprised by Chetahs or Hunting Leopards trained for the purpose; and are also occasionally flown at by Hawks, which keep them occupied until the dogs have time to come up with them and seize them. Another mode of catching the males, according to Thevenot, is by twisting a rope in various intricate turns round the horns of a tame one and turning him out among the herd. The head of the family immediately resents this invasion of his privileges and a battle ensues, which, being carried on with the horns alone, speedily terminates in entan-

gling the two together, and the capture of both follows as a necessary consequence.

The Indian Antelopes are as easily reconciled to captivity as the Deer, which they so much resemble in their manners ; and might consequently be introduced into our parks with equal advantage, and perhaps superior ornament, should the climate not prove uncongenial to their propagation. The few which have been occasionally brought to Europe appear not to have suffered in any great degree by the change. A pair which were kept in the Menagerie of the Prince of Orange in the neighbourhood of the Hague about the middle of the last century, and of which Pallas has left an interesting account, lived there for several years, bore the winter as well as the deer preserved in the same establishment, and produced young in their confinement. The male is spoken of as being wild and shy ; but the female seems to have been perfectly gentle, good tempered, and familiar. She would take bread from the hands of the visitors, raising herself on her hind legs for the purpose ; and seemed to feel pleasure in being noticed. When driven about in their enclosure, they would generally commence at a trot, then break into a gallop, and at length set off at full speed, taking leaps of a surprising length.

The Society's specimen, a full grown male, exhibits but little shyness, and is remarkably good tempered. If provoked it butts with its forehead, but does not appear to make use of its horns as weapons of offence. It has been for several months an inhabitant of the Garden, and has hitherto, notwithstanding the wetness of the season, borne the climate well. A beautiful Albino, formerly in the Collection, is also figured in the cut.



THE NYL-GHAU.

ANTILOPE PICTA. PALL.

THE Nyl-ghau was quite unknown to the older naturalists. A notice of a nameless "Quadruped brought from Bengal," inserted by Dr. Parsons in the forty-third volume of the Philosophical Transactions, and accompanied by an imperfect figure, appears to contain the earliest description of this fine species of Antelope. But neither the description nor the figure were recognised as belonging to the Nyl-ghau, when the latter again made its appearance in England in 1767. A pair, male and female, were in that year sent from Bombay as a present to Lord Clive, to whom we are indebted

for the first introduction of many rare and interesting animals. Shortly afterwards a second pair, which had been presented to the Queen, were placed by her Majesty at the disposal of Dr. William Hunter, who published, also in the Philosophical Transactions, a full and detailed description of them, together with an excellent figure from the pencil of Stubbs, the most distinguished animal painter of his day. They were immediately adopted by Pennant in his Synopsis, where they were again figured, as a species of Antelope; and his classification has been followed by Pallas, and all subsequent systematists.

The male Nyl-ghau is superior in stature to the Stag, as well as more robust in his proportions. His head is rather large; his muzzle long and narrow; his ears middle-sized, open, and terminating abruptly in an obtuse point; his neck long and thick; his shoulders surmounted by a slight hump; his hinder quarters much less elevated than his fore parts; his legs thicker than those of most other Antelopes; and his tail of considerable length, reaching below the joint of the leg, and ending in a tuft of long hairs. His eyes are full, black, and prominent; and his suborbital sinuses large and obvious. The form of his horns is conical and slightly curved, with the concavity directed inwards and the points turned forwards. They take their origin by a triangular base of considerable thickness, marked with two or three indistinctly elevated rings, but become perfectly round and smooth above, tapering rapidly into a rather obtuse point. Their length is from seven to eight inches; and their colour a uniform dull black, corresponding with that of the hoofs.

On all the upper parts of the body the general colour is of a slaty gray, the bases of the hairs being for the most part white with an occasional tinge of brown, and their tips dusky black. A thin mane of long black and

white hairs extends along the middle line of the neck and part of the back. The head, legs, and under parts of the body are of a much deeper shade than the upper, the general tint being grayish black with a slight mixture of brown. On the forehead a few darker lines pass obliquely above and between the eyes. The muzzle, lips, inside of the mouth, and tongue are dusky brown. Along the outer edges of the lips and on the fore part of the chin, the hairs are pure white; two roundish spots of white also occur on either side of the face behind the angle of the mouth, and a third, less distinctly marked, above the inner angle of the eye. A narrow band of white passes along the centre of the throat, and terminates on the upper part of the neck in a broad patch. The legs are also most commonly marked by a transverse white band immediately above the hoofs in front, and by a second patch of the same opposite to the accessory hoofs on the inner side. Beneath the fore part of the neck is a tuft of long pendulous black hairs; and those which terminate the tail are of the same colour. The under side of the latter, the long hairs by which it is fringed, and the adjacent parts, are nearly white.

The female is much smaller than the male, and at the same time lighter and more slender in her proportions. She is entirely destitute of horns, has less hump on the shoulders, and her hind quarters are more nearly on a level with her fore. Her general colour, as also that of the young male, is a pale reddish brown, marked with precisely the same spots and patches of white as appear upon the full grown male.

The Nyl-ghaus appear to be by no means generally spread over the peninsula of Hindoostan, but to be confined to its north-western provinces and the countries situated between them and Persia. Bernier, who alone of all the older travellers mentions the animal by

name or in such a manner as to admit of its being recognised, introduces it incidentally as one of the beasts which were hunted by the Mogul Emperor Aurung-zebe during his progress from Delhi to his summer retreat in Cashmeer. It would seem from the numbers of which he speaks as being sometimes taken on those occasions, to be very abundant ; but we have not, up to the present time, any particular account of its habits in a state of nature. In captivity it is gentle and familiar, licking the hands of those who offer it bread, and suffering itself to be played with, not only without shyness, but with evident pleasure. There are, however, seasons at which it becomes capricious in its temper. When meditating an attack it falls suddenly upon its fore knees, shuffles onwards in that posture until it has advanced to within a few paces of the object of its irritation, and then darts forward with a powerful spring, and butts with its head in the most determined manner. Its walk is awkward in consequence of the comparative shortness of its hind legs, and the width to which it extends them ; but in running this defect is scarcely perceptible. Lord Clive's original specimens several times produced young ; but we are not aware that the breed has been continued, or that the same success has attended their introduction in other quarters.





THE POLAR BEAR.

URSUS MARITIMUS. EXXL.

WERE we to judge of the magnitude and ferocity of the Polar Bear from the relations of the older navigators alone, we should be compelled to regard it as the most tremendous beast of prey in existence. Later and more accurate observations have, however, taught us that the statements which formerly passed current with respect to it were, to say the least, grossly exaggerated; the terrors of the writers having obscured their judgment, or their attachment to the marvellous having superseded their love of truth. Thus when we are told by Gerard de Veer that the skin of one killed by him and his comrades measured twenty-three feet in length; by Heemskirk, another of the same party, that they were frequently attacked by the bears, which

seized on the bodies of the seamen, carried them off in their mouths with the greatest ease, and devoured them at their leisure within sight of the survivors ; or even by Robert Lade, that two of these animals made an attack upon a party of hunters, killed several of the natives, and desperately wounded two Englishmen ; we are quite unable to reconcile their statements with the fact that the Polar Bear is in reality but little larger than the common European species, and more dangerous only in proportion to this augmentation in size.

Of the vast numbers observed by our adventurous countrymen in the late northern expeditions, the largest appears to have been one, the length of which is stated by Captain Lyon at eight feet seven inches and a half, and its weight at sixteen hundred pounds. No previous authentic measurement had much exceeded seven feet ; and the far greater number even of fully adult individuals are spoken of as of very inferior dimensions. A specimen in the French Menagerie, which afforded M. Cuvier the first truly characteristic representation of the species ever published, measured about six English feet at its first arrival, and had not increased in size at the end of seven years. A female mentioned by Dr. Richardson as having been attended by two cubs, and therefore unquestionably adult, " was so small that two or three men were able to lift her into a boat." And another female, also adult, of which some account is given by Pallas, was no more than six feet nine inches from the tip of the nose to the root of the tail. These instances are fully sufficient to show the fallacy of the measurements transmitted to us by the earlier writers.

The shape of the Polar Bear is very different from that of the more strictly terrestrial species, and seems peculiarly fitted to the liquid element in which it passes

the greater part of its existence. Without losing the clumsiness of form so characteristic of the genus, it is much more elongated in all its parts excepting the legs, and makes an approach in this particular, although it must be owned a very distant one, to the Otters and other amphibious beasts of prey. The flatness of its head also presents a striking analogy to the same tribe of animals. Instead of the indentation between the forehead and muzzle observable in the Brown Bear, the line of its profile is nearly straight, while the upper and hinder part of its cranium is rather depressed than elevated. The muzzle itself is broader and thicker, and the head much narrower and more cylindrical. But the most remarkable elongation occurs in the neck, which is nearly twice as long and quite as thick as the head. The feet also are longer than in the Brown Bear, and are more than proportionally broad. The ears and mouth are peculiarly small. The fur is throughout of a dull silvery white with a slight tinge of yellow. It is short and even on the head, neck, and upper part of the back; and long, fine, and woolly on the hinder parts, belly, and legs. The extremity of the nose, a circle round each of the eyes, and the margins of the lips are black, with somewhat of a violet tinge on the latter. A still lighter shade prevails on the tongue and inside of the mouth. The sole is almost entirely clothed with long hair, by which a firm footing on the ice is secured; and the claws are short, thick, black, and but little curved.

But the differences in manners and habits between the White and the Brown Bears are still more remarkable than those of form. Instead of seeking with the latter the covert of the forest and choosing in preference the most alpine regions, it invariably makes its abode upon the sea-coast or in the sea itself, preferring the

unsheltered summit of an iceberg to every other situation. Fearless of cold, or rather appearing to be most at ease in those latitudes where the cold is most intense, it rarely migrates, even with its floating islands, much beyond the precincts of the Arctic Circle. Considerable numbers of them are propelled, by a continuance of the northern and western winds, on that part of the coast of Siberia which lies between the Lena and the Jenisei; and the great frozen island of Nova Zembla is periodically subject to their visitations. On the whole northern coast of America, even so far south as Hudson's Bay, in Greenland and Spitzbergen, they are by no means uncommon; but they are said never to have been observed on the coast of Kamtschatka or in the sea which separates the great western continent from Asia. Occasionally they approach the shores of Iceland and even of Norway; but only when driven by necessity, and to meet a certain death at the hands of the hardy natives.

In the situations which it frequents it is obvious that the Polar Bear cannot subsist upon a vegetable diet, which it has in fact no means of procuring. But although of necessity carnivorous, it is not essentially a predatory animal in the strict sense of the term; for it seems generally to prefer a dead to a living prey. Its principal food consists in the floating carcasses of whales and fishes; but before the breaking up of the ice, and on the approach of winter, it watches at the openings in the frozen deep for the seals and other animals which approach them in quest of air, seizes them with great dexterity the moment they emerge from beneath, and devours them with disgusting voracity. It also sometimes feeds on living fish, more especially when they enter in shoals the gulfs and inlets of the sea; and Cartwright mentions an instance

in which he saw a Polar Bear diving after a salmon and succeeding in capturing it, a striking proof of the agility of its movements in the water. In the autumn, we are told by Dr. Richardson, it frequents the shores in search of berries and other vegetable matters; but this deviation from its usual habits is probably more from necessity than choice. We have no account of its climbing trees; neither does the structure of its claws or its general organization appear fitted for such a purpose.

The females of this species retire into their winter quarters about the middle of September according to Pallas, or not till the end of December according to Hearne, and leave them with their young in March or April. They do not take much pains in the selection or preparation of their abode; but generally lie down under a projecting mass of ice, or bury themselves in the snow, which frequently covers them to a very considerable depth. It has been doubted whether the males also hibernate, or whether they do not, as Hearne maintains, remain at large during the whole of the winter, feeding upon seals, which they catch on the extreme ledges of the ice. It is certain that they are occasionally met with as late as December, and probably also in January and February; but these may be only individual instances, in which the animals, not having accumulated sufficient fat for their winter sustenance, were compelled by hunger to shift for themselves during the usual period of torpor. The males of none of the species appear to hibernate with the same regularity as the females, in whom this process appears to be essential to the preservation and security of their offspring. When they first emerge from their winter retreats they are extremely lean; and the cravings of their own appetites, combined with the necessity of providing for their young, render them at this period

more ferocious than at any other. Each is generally followed by two cubs, which, in the language of Hearne, "are not larger than rabbits, and make a footmark on the snow no bigger than a crown-piece." The old bears are extremely careful of their young, and fight desperately in their defence.

At other times they are by no means formidable, never making the first attack upon a man, although they frequently turn upon him with the utmost fury when attacked by him. Like the other bears they raise themselves for this purpose upon their hinder feet, and rush blindly onwards upon their adversary, who has only to slip nimbly on one side and plunge his weapon into the animal's heart. In this manner the miserable Samoiedes and Tungoses, armed only with a short spear, are not afraid singly to encounter a bear, which, if we are to credit the relations of travellers, was capable of striking terror into the hearts of bands of civilized Europeans armed with muskets, powder, and ball.

In captivity the Polar Bear has much of the manners of its congeners, but its attitudes are altogether different. Its favourite postures are lying flat at its whole length; sitting upon its haunches with its fore legs perfectly upright and its head and neck in a dependent position; or standing upon all fours with its fore paws widely extended and its head and neck swinging alternately from side to side or upwards and downwards in one continued and equable libration. It feeds ravenously upon fish, and refuses no kind of flesh that is offered to it; but that it may be kept entirely upon vegetable food was proved on two individuals confined in the Paris Menagerie. One of these lived five years on bread alone, and the other had thriven upon the same diet for no less than seven years. Our specimen is fed, like the other bears in the collection, upon a mixture of animal and vegetable food.



THE RED MONKEY.

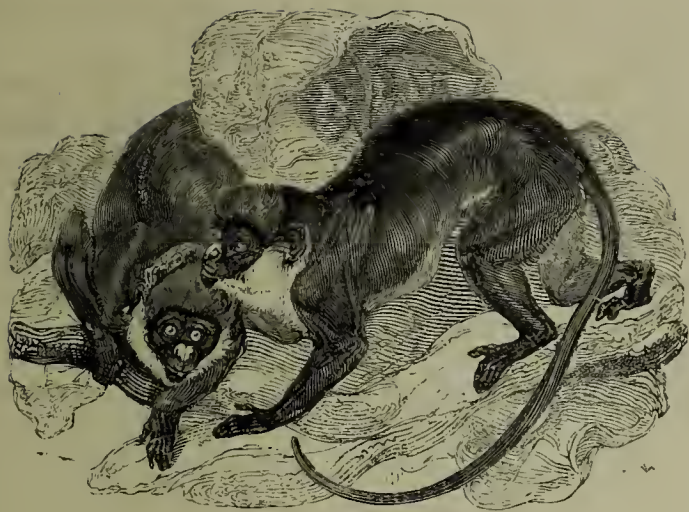
CERCOPITHECUS RUBER. GEOFF.

THE Red Monkey of Pennant, the Patas of Buffon and the French writers, is well distinguished from all the other species of *Cercopithecus* by its peculiar colour and the singularity of its markings. The whole of the upper surface of its head, which is broad and flat, is of a deep rufous brown, which becomes lighter and assumes a rustier tinge on the back and on the outer sides of the limbs, and is continued along the tail until it is lost in the yellowish gray which terminates that organ. A patch of short dusky black hairs occupies the extremity of the nose, and extends upwards in a narrow line to the middle of the forehead, where it joins a series of long stiff coal-black hairs forming an arch over each of the eyes and separating the livid flesh-colour of the orbits and anterior part of the face from the red hairs which clothe the scalp. This double arch terminates in a somewhat expanded patch

above the outer angles of the eyes. The sides of the upper lip are edged with a narrow line of the same short dusky hairs which cover the nose. Beneath the ears, which are blackish and moderately large, the hair forms broad thick bushy tufts of a light gray, which advance forwards upon the sides of the cheeks and lower jaw, so as to limit the naked part of the face to a narrow space between the eyes and the upper lip. From these tufts the hair is continued of the same colour on the whole of the under surface of the body, and on the inner sides of the limbs. The hands are dusky brown, with very short fingers, the thumb of the fore hand especially being reduced almost to a mere tubercle. The facial angle is moderately elongated, and the nose flattened. The body measures about sixteen inches in length, and the tail is nearly equal.

This monkey is a native of Senegal, and perhaps also of Upper Egypt. In character and disposition it closely corresponds with the neighbouring species. Our specimen is lively and active, but somewhat irascible if disturbed or handled. It is, however, too young to be dangerous. When pleased it dances on all fours in a peculiar and measured step, which is far from being ungraceful; although after a time it becomes ludicrous from its regular monotony.





THE LESSER WHITE-NOSED MONKEY.

CERCOPITHECUS PETAURISTA. GEOFF.

THIS pretty little Monkey, first described by Allamand in the Amsterdam edition of Buffon under the name of Blanc Nez, is one of the smallest, and at the same time one of the most curiously marked, as far at least as regards the face, among the Cercopithecæ. It may always be recognised at the first glance by the white patch which occupies the extremity of its nose, and which occurs in none of the other monkeys, except the *Cercopithecus nictitans*, the White-nosed Monkey of Pennant, and Guenon à Nez Blanc prominent of Buffon. From this species, however, it is well distinguished by the remarkable flatness of that feature which in the latter is peculiarly prominent. Some confusion in the synonymy has been created by Audebert, who has figured in his *Histoire Naturelle des Singes* a mere variety of the Blanc-nez, in which the naked parts of the face are of a bluish violet, under the name of

Ascagne, adopted by most of the later French naturalists as the designation of the species.

The white spot on the tip of the nose which gives so peculiar a physiognomy to the present species is formed by short smooth close-set hairs, on either side of which a narrow line of deep black passes obliquely downwards towards the angle of the mouth, and joins a circle of the same colour surrounding the naked part of the face and orbits. The colour of the latter parts is dusky or brownish black. On the outer side of this circle the cheeks and lower part of the face are covered with long whitish hairs, which form separate tufts beneath the ears, where they take a direction backwards. The same light-coloured hairs are continued along the whole inferior surface of the body, and also, with a slight mixture of gray, on the inner sides of the limbs and under part of the tail. The general colour of the upper surface is brown mixed with gray, deeper on the back and tail, and on the outer sides of the limbs. The hands are nearly black. The usual length of the body is from ten to twelve inches, and that of the tail half as much again.

In manners and disposition this species is lively, active, and generally good-tempered. Our specimen was, however, by no means familiar, and appeared to be particularly anxious to conceal its face, crying out and kicking with all its might when handled for the purpose of inspection. It died in the spring of last year, and its stuffed skin is now preserved in the Society's Museum. Another specimen has since been added to the Menagerie.

The Lesser White-nosed Monkey is a native of Guinea, and seems to be peculiarly susceptible of cold, seldom bearing for any length of time the rigour of a European climate.



THE SLOW-PACED LEMUR.

LORIS TARDIGRADUS. GEOFF.

IN an early Memoir on the family to which this singular little creature belongs, M. Geoffroy-Saint-Hilaire divided it for the first time into those minor groups of which it was most obviously composed. But he has subsequently carried the principle of subdivision to a still greater extent by separating the present species from the Slender Loris, with which he had previously associated it, in order to form of it and of some other doubtful species a new genus under the name of *Nycticebus*. We cannot perceive any sufficient grounds for thus disuniting two animals so intimately allied to each other, and differing in no more essential characters than the somewhat greater length of the nose and of the limbs in the one than in the other. It is for this reason that we prefer his older arrangement, and proceed in accordance therewith to describe our animal as a species of *Loris*, a well marked, circumscribed, and

natural genus, differing from the Lemurs of the same author in many highly important characters. It is to be regretted that M. Geoffroy should not have applied the latter name to the species to which it was originally given by Linnæus, and to which alone it is in any degree applicable; the Madagascar animals at present comprehended under it not presenting even one of those characters on which Linnæus himself states that his generic name was founded.

In common with the latter group the genus *Loris* forms part of that division of the Quadrumanous Order which is essentially distinguished by an unequal number or irregular disposition of the incisor teeth in the two jaws; terminal nostrils with sinuous openings; and a long subulate or sickle-shaped claw upon the forefinger of the hinder hands, all the rest of the nails being flat and rounded like those of the greater part of the monkeys and of man. The *Loris* differ from the other genera of this family in having four incisors in the upper jaw, placed in pairs with a vacant space between, and six in the lower, directed obliquely forwards; canines of moderate size; twelve molars above and ten below; a short rounded head; and little or no tail. Sometimes, it would appear, the lateral incisors of the upper jaw, which are always smaller than the others, are either entirely wanting or so minute as not to be easily seen. But M. Geoffroy was enabled to detect them in the identical specimen which Vosmaer had declared not to possess them; and it is by no means improbable that future investigators may ascertain their existence in the stuffed individuals sent from Java by M. Leschenault, of which M. Geoffroy has made a new species, principally on account of the supposed absence of these teeth. In addition to these primary characters the *Loris* are distinguished by large prominent eyes, placed in front of the head and at no

great distance from each other; short ears, scarcely rising through the hair with which they are invested; a rough tongue; nostrils projecting beyond the mouth and surrounded by a naked muzzle; and thumbs widely separated from the fingers both on the fore and hinder hands.

Linnæus confounded both the well authenticated species of this group, the Slender Loris and the present, under the name of *Lemur tardigradus*. It is evident that he had seen them both; for in the *Musæum Adolphi Friderici Regis* he describes the former from one of the specimens previously figured by Seba, and in the tenth edition of his *Systema* gives a short but characteristic description of the latter. This was well described and figured by Vosmaer in 1770; and adopted from his book by Buffon in the last of his supplementary volumes. In the latter place some curious particulars relative to its habits were added from the observations of M. D'Obsonville, who afterwards republished them together with many other details of a similar kind in his interesting *Essays*. Sir William Jones has also given an excellent account of a specimen in his possession: and M. John has added some interesting details founded on the observation of several individuals. Its article in Shaw's *Zoology*, compiled from Vosmaer and Sir William Jones, is enriched by some valuable observations on its anatomy from the pen of Sir Anthony Carlisle. And latterly Mr. Baird has published, in *Loudon's Magazine of Natural History*, a very full and interesting account of an individual brought by himself from India. As far therefore as regards its zoological characters and manners in captivity, its history may be considered as tolerably complete. Of its habits in a state of nature we yet know but little.

The Slow-paced Lemur is an animal of small size, scarcely equal to that of a cat. The largest individual

yet noticed appears to be that seen by Pennant, who states its length at no less than sixteen inches from the nose to the extremity of its back. Its proportions are short and thickset; and the apparent clumsiness of its form is much increased by the manner in which it usually contracts itself into a kind of ball. Its head is broad, flat, and rounded, with a slightly projecting and pointed muzzle, in which the nostrils are perforated laterally. Its eyes are large and perfectly orbicular, and furnished with transverse pupils capable of being entirely closed during the day, and of being very largely dilated at night: their inner canthus is situated so low towards the nose that the motion of the eyelids appears to take place in a diagonal, instead of a horizontal, direction. The ears are short, round, widely open, but buried in the fur; and the tail is merely a rudiment of a few lines in length. The hinder limbs are considerably longer than the fore. The whole of the body, with the exception of the muzzle and hands, is thickly invested with long, close, woolly hair of a deep ashy gray with something of a brownish tinge. A deep brown or chestnut band passes along the middle line of the back, and is accompanied on either side by a faint grayish stripe, expanding on the back of the head into a still lighter patch. The dark middle stripe divides on the head into two branches, each of which is again subdivided, the posterior division passing transversely across the forehead and enclosing the ear, the anterior crossing the eye obliquely and extending to the angle of the mouth. Between the two, above the outer angle of the eye, is a large white spot. Each of the eyes is surrounded by a ring of dusky black, between which a narrow white line passes from the back part of the head to the tip of the nose, which, with the exception of the naked muzzle, is also white. The latter, together with the naked parts of the hands, is of a livid flesh-

colour with a tinge of black. On the under surface the fur is of a lighter gray than above.

The habits of this singular creature are perfectly nocturnal. It sleeps throughout the whole of the day, unless when disturbed, either rolled up on the floor of its cage, or more commonly suspended by its paws from the bars, with its body drawn together and its head folded in upon the breast. Towards evening it rouses itself by degrees, and remains watchful during the night. Its first care on awaking is to make itself clean by licking its fur like a cat ; and its next to satisfy its appetite. Its natural food appears to consist of a mixture of animal and vegetable substances. The latter, especially the sweeter fruits, and sopped bread sprinkled with sugar, have usually formed the principal part of the diet of those with whose history we have been made acquainted ; but the smaller animals, whether mice, birds, or insects, appear to be more peculiarly acceptable. In its motions it is excessively slow and languid. When on the ground its posture is constrained and unnatural, and it rather drags itself along than walks. On a tree, or in mounting the bars of its cage, it seems more at its ease, but still moves with slow and cautious regularity. Grasping a branch or a bar in the first place tightly with one of its fore paws, it gradually fixes the other, and then advances its hinder hands with equal slowness and precision, never quitting its hold with the one until it has ascertained the firmness of its grasp with the other.

In consequence, as we may imagine, of this want of activity, the Slow-paced Lemur is peculiarly susceptible of cold, to guard it from which its thick fur, so unusual in the animals of a tropical climate, is beautifully adapted. Generally speaking it is a timid and even a gentle animal, rarely offering offence unless when provoked or hastily disturbed from its slumbers. On such

occasions it will bite with considerable fierceness. But in cold weather its anger is much more easily roused, and it evinces an excessive degree of irritability. Notwithstanding its apparent slothfulness it is easily disturbed, more especially by any unusual sound, the complicated structure of its large open organs of hearing rendering them peculiarly susceptible. It seems to become after a time in some degree familiar with those by whom it is fed and protected, and allows them to stroke it on the head and throat, appearing to take a pleasure in their caresses.

In feeding it commonly seizes its food with both hands, and then consigns it to one, sitting upright on its haunches and generally suspended by its hinder paws, to eat it. When a small live animal is placed within its reach, it relaxes its hold with its fore paws, and seizing its victim with more rapidity than might be expected from its ordinary habits, destroys it with much dexterity, and soon deposits the carcass in its stomach, devouring the bones as well as the flesh, but rejecting the feathers of birds which it previously plucks off. It is probable that in a state of nature it lives almost wholly upon the trees, prowling abroad at night, and preying upon sleeping birds, insects, and mice; which it approaches unawares and seizes before they are sufficiently roused to notice its proximity; they would otherwise readily make their escape from an animal so tardy in its motions. When it fails in procuring these, it may have recourse to fruits, on which alone it thrives very well in captivity.

Its nocturnal and unobtrusive habits may probably account in some degree for the rarity of its appearance. It seems, however, to be widely spread, having been found in Bengal and other parts of the Peninsula of Hindoostan, and in Ceylon, Penang, and Java.



THE RED LEMUR.

LEMUR RUBER. PÉRON.

THE Red Lemur is not only one of the most beautiful animals of the singular group to which it belongs, but it also possesses the additional recommendation of being unquestionably the rarest known species. Although originally discovered by Commerson, among whose papers a drawing of it was found, it remained unknown to science until the return to France of the memorable expedition under Captain Baudin. The zoologists of that celebrated voyage, MM. Péron and Le Sueur, brought home with them a single skin, from which they were enabled to characterize it as a distinct species. Nothing farther was known with respect to it until within ten years of the present time, when a living individual, scarcely more than half as large as that which now exists in the Society's collection, was brought to Paris and was figured by M. Frédéric

Cuvier in his splendid work. A living specimen in the collection at Exeter Change has since been noticed by Mr. Griffith in his *Vertebrated Animals*. We are not aware that any other specimens, either living or dead, have fallen under the observation of zoologists; and we therefore feel justified in regarding it as a singularly rare and interesting creature.

In the preceding article we have briefly stated the characters of the grand division of the Quadrumanous Order, to which belong both the Slow-paced Lemur or Loris, and the true Lemurs of modern authors. It therefore only remains in the present instance to point out in what respects the latter genus differs from all the other groups which constitute the family. These differences consist principally in the number and position of its teeth; the form of its head; and the proportional length of its limbs and tail. In the true Lemurs the incisor teeth are six in number in the lower jaw, long, slender, and sloping forwards; and four in the upper, ranged in pairs with a vacant space between, the bone being too thin at its anterior part to admit of the implantation of teeth within its substance. The canines of the lower jaw differ from those of the other Quadrumanous families in their short triangular shape, and in their locking in, when the mouth is closed, behind those of the upper, which are long, very much curved, and extremely thin. The cheek teeth consist of three false and as many true molars on either side of the upper jaw; and of only two false and three true molars in the lower. The head is elongated, triangular, and pointed, with a sharp projecting muzzle. The posterior limbs are little longer than the anterior; the tail is long, thick, and bushy; and the whole body is covered with thick close woolly hair to such a degree as nearly to double in appearance its real bulk. In

other respects the Lemurs agree for the most part with the other animals which compose the family. As in them their hands and feet are equally well formed for grasping with those of the Monkeys, to which they approximate very closely in the more essential points of their internal structure; the fore-fingers of the posterior extremities have long subulate claws, while the nails of all the other fingers are flat; their eyes are large and directed forwards; and their nostrils terminal in a naked muzzle. None of the group exceed from two feet to two feet and a half in length, exclusive of the tail; and the greater number of them are scarcely more than half that size. Upwards of a dozen species have been described; but it is probable that of these not more than eight or nine would stand the test of a rigid examination.

The Lemurs are all natives of Madagascar and of one or two smaller islands in its neighbourhood. We know but little of their habits in a state of nature, but they are said to live in large bands upon the trees, feeding principally upon fruits; and their conformation renders this account extremely probable. They are almost equally agile with the Monkeys; but are much more gentle and peaceable in their dispositions. In captivity they are generally good-tempered, but do not usually exhibit much playfulness or intelligence. After a time, however, they become familiar with those who have the care of them, towards whom they will sometimes evince a considerable degree of affection. Fruits and roots form the principal part of their nutriment; but dressed meat or even raw fish appear to be not unwelcome additions to their vegetable diet. Notwithstanding the thickness of their coats they are extremely chilly, and are very fond of basking in the sun or crouching by the fireside. In walking or leaping they

usually raise their long bushy tails above the level of their backs; but when at rest they either suffer them to hang down, or coil them around their bodies to retain the warmth.

In the Red Lemur the general colour of the upper surface of the body is of a bright rufous brown, and that of the under parts of a deep black. The former includes the sides of the face, the ears, the back and sides, and the outer surface of the limbs; the latter the forehead, the naked face itself, the throat, breast, and abdomen, the inside of the limbs, and the entire feet, with the exception of a narrow stripe of white passing across the upper surface of the hinder ones. The tail is perfectly black throughout. A large oval patch of white occupies the back of the neck, extending from behind the ears to between the shoulders, and separating the black of the head from the red of the back. In M. F. Cuvier's figure it would appear as though a band of red passed between this white patch and the black of the head transversely from ear to ear; but no such marking is visible in our specimen, nor is it referred to in that gentleman's description of his animal. M. Desmarest has also, both in his *Mammalogie* and in the *Dictionnaire des Sciences Naturelles*, described the naked face and hands as of a deep red: in our specimen, as in M. F. Cuvier's figure and description, they are of the purest black. The irides are of a lighter yellow than those of the other species of the genus, and the eyes are lively and expressive. The moustaches are short, black, and rather numerous. The hair of the upper parts and tail is extremely long, soft, and woolly; the dark fur of the under surface shorter and close. From the nose to the root of the tail measures upwards of two feet, and the tail itself is still longer.



THE THIBET DOG.

CANIS FAMILIARIS. Var. *MOLOSSUS THIBETANUS.*

FOR the following particulars relative to these gigantic dogs we are indebted to the kindness of Mr. Broderip, to whom they were communicated by Dr. Wallich.

“These noble animals are the watch-dogs of the table land of the Himalaya mountains about Thibet. Their masters, the Bhoteas, to whom they are most strongly attached, are a singular race, of a ruddy copper-colour, indicating the bracing air which they breathe, rather short, but of an excellent disposition. Their clothing is adapted to the cold climate which they inhabit, and consists of fur and woollen cloth. The men till the ground and keep sheep, and at certain seasons come down to trade, bringing borax, tincal, and musk for sale. They sometimes penetrate as far as Calcutta. On these occasions the women remain at home with the dogs, and the encampment is watched by the latter, which have an almost irreconcilable aver-

sion to Europeans, and in general fly ferociously at a white face. A warmer climate relaxes all their energies, and they dwindle even in the valley of Nipāl."

"Those before us, which are very gentle, came from the neighbourhood of Diggarchee, the capital of Thibet, and are supposed to be the only individuals domesticated by Europeans: the Hon. Edward Gardner, British resident at the court of the Rajah of Nipāl at Katmandoo, never heard of another instance, and they may therefore be considered very great rarities. Dr. Wallich brought them over to this country for the Hon. East India Company. The East India Company presented them to his Majesty, and his Majesty was graciously pleased to transfer them to the Garden of the Zoological Society." They died, we regret to add, shortly after their arrival.

To the foregoing account we can only append a few additional details derived from the relations of those travellers by whom these dogs have been more particularly noticed. The first of these is Captain Turner, who thus introduces them in his Account of an Embassy to the Court of the Teshoo Lama in Thibet, published in 1800: "The mansion [of the Rajah of Bootan] stood upon the right; on the left was a row of wooden cages, containing a number of large dogs, tremendously fierce, strong, and noisy. They were natives of Thibet; and whether savage by nature, or soured by confinement, they were so impetuously furious, that it was unsafe, unless the keepers were near, even to approach their dens."

A few pages further on our author exhibits them in a much more favourable point of view, as the watchful guardians of the fold. But the most characteristic anecdote respecting them furnished by Captain Turner is thus related. Entering a Thibet village, and "being," he says, "indolently disposed, and prompted by mere

curiosity, I strolled alone among the houses : and seeing every thing still and quiet, I turned into one of the stone enclosures, which serve as folds for cattle. The instant I entered the gate, to my astonishment, up started a huge dog, big enough, if his courage had been equal to his size, to fight a lion. He kept me at bay with a most clamorous bark, and I was a good deal startled at first ; but recollecting their cowardly disposition, I stood still ; for having once had one in my possession, I knew that they were fierce only when they perceived themselves feared. If I had attempted to run, he probably would have flown upon me, and torn me in pieces, before any one could have come to my rescue. Some person came out of the house, and he was soon silenced."

Similar accounts of the large size of these dogs, as well as of their ferocity and antipathy to strangers, which seem to be regarded as their uniform characteristics, are given by other writers. Captain Raper, in his *Narrative of a Survey for discovering the Sources of the Ganges*, speaking of the trade carried on by the natives of Bootan, says, "Dogs are also brought down by these people.— One of them was a remarkably fine animal, as large as a good-sized Newfoundland Dog, with very long hair and a head resembling a Mastiff's. His tail was of an amazing length, like the brush of a fox, and curled half way over his back. He was however so fierce, that he would allow no stranger to approach him ; and the same fault was observable in the rest of this species." Mr. Moorcroft also, in his *Journey to Lake Manasarovara*, says, "The Uniyas had dogs with their flocks, which were fierce and much disposed to attack strangers."

There can be little doubt that the dogs thus spoken of were all of the true Thibetan race ; but we can hardly help suspecting that Mr. Fraser, in his *Tour*

through part of the Himālā Mountains, has confounded them with other breeds. He frequently mentions the dogs of Bischur, of whose strength and activity wonderful tales were told, but always with an air of incredulity both as to their size and powers. This circumstance would lead us to suspect that he had never seen the genuine breed, and our suspicions are strongly confirmed by those passages in his work in which he incidentally touches upon their distinctive characters; for it is clear that a dog "not bigger than a pointer," although "rough-haired and very fierce," could never have been mistaken for a Thibet Dog by one who was acquainted with the legitimate race.

Our specimens were larger in size than any English Mastiff that we have seen. Their colour was a deep black, slightly clouded on the sides; their feet and a spot over each eye alone being of a full tawny or bright brown. They had the broad short truncated muzzle of the Mastiff, and lips still more deeply pendulous. In fact, there appeared throughout a general looseness of the skin; a circumstance which M. Desmarest has pointed out as characteristic of his "Dogue du Thibet," of which, however, he gives no particular description. It is, we have no doubt, the same animal; but we know not whence his scanty information respecting it was derived.





THE BEAVER.

CASTOR FIBER. LINN.

AMONG the numerous, widely dispersed, and prolific tribes of animals which compose the extremely natural Order, called by Linnæus and the writers of his school Glires, there are none perhaps which possess so many claims on our attention as the well marked and circumscribed little group on the history of which we are about to enter. The Beavers in fact interest us not only as furnishing a most valuable fur, and as producing a peculiar secretion occasionally and advantageously employed in medicine, but also as offering the most remarkable of the few instances occurring among quadrupeds, of that architectural instinct, so remarkably prevalent in the inferior classes, which impels them to construct their own habitations with materials selected for the purpose, brought from a

distance, and cemented together so as to form a regular and uniform structure.

The first and most essential character of the Order to which they belong is obviously derived from the great developement of their incisor teeth; and this peculiarity in structure, as might naturally be expected, is connected with a peculiarity in habits equally remarkable. So striking indeed is the propensity to gnawing, which distinguishes these animals, that many later zoologists, of the French school especially, have thrown aside the older designation applied to them by Linnæus, and adopted in its place the expressive name of *Ronguers* or *Rodentia*. Of this faculty the Beavers appear to exhibit the highest degree of developement: their powerful incisor teeth not only serving them to strip off and divide the bark of trees, which forms their principal nutriment, but also enabling them, when urged by their instinct of construction, to gnaw through trunks of considerable thickness, and thus to obtain the timber of which they stand in need for the building of their habitations. These important organs contribute therefore, in an especial manner, to supply them both with food and shelter.

The incisor teeth of the Beavers are two in number in each jaw: they are broad, flat, and generally coloured of a deep orange or almost chestnut brown anteriorly, and pass into acute angles on their posterior surface. Their extremities terminate externally in a cutting edge, and shelf considerably inwards; for the anterior surface being alone coated with enamel, and consequently offering the greatest resistance, is less easily worn down by the action to which they are exposed. Those of either jaw correspond exactly with their opposites, and the form of the articulation of the lower jaw admitting of little or no lateral motion, their action is always from

behind forwards and vice versa. They have no true roots, but are of equal thickness throughout, and are implanted within the jaw in sacs or capsules, which reproduce them from the base as fast as they are worn down at the extremity. So strong a tendency have they to increase by this process, that whenever one of the incisors of either jaw has been accidentally injured or destroyed, the opposite tooth, meeting with no resistance from its antagonist, is propelled forwards by a continual enlargement from the base, to such an extent as to become at length perfectly monstrous. This mode of growth is common to the whole Order; and the number of the incisor teeth is also the same in all the groups that compose it, with the exception of the Family of which the Hare forms the type.

The entire absence of canine teeth, leaving a vacant space of some extent between the incisors and the molars, is another character which the Beavers have in common with all the Rodent animals; but the structure of their molar teeth differs from that of any other group. These latter organs furnish indeed the best characters that have yet been employed for the separation of the Rongeurs into distinct and natural genera. In the Beavers they are four on each side in either jaw, and their crowns present a flattened surface on which the lines of enamel are so disposed as to form three folds on the outer side and one on the inner in those of the upper jaw, while those of the lower offer an arrangement directly the reverse. They were formerly suspected by M. F. Cuvier, who has paid particular attention to the teeth of the mammiferous quadrupeds, to be destitute of proper roots, and to increase from their base in the same manner as the incisors; but he has since candidly confessed the error into which he had been led by the inspection of a cranium in which

they were not yet fully developed, and he now admits that in the adult animal they are furnished with true roots, and are consequently incapable of receiving any addition to their growth when once completely formed. Their flattened crowns sufficiently indicate that the food which they are intended to masticate is entirely vegetable.

In the regularity of their line of profile from the back of the head to the extremity of the nose, the lateral position of their diminutive eyes, the depth, obliquity, and obtuseness of their muzzle, the vertical fissure of their upper lip, the softness and closeness of their fur, and the greater length and muscularity of their posterior limbs, the Beavers may be regarded as almost typical of the Order to which they belong. They exhibit, however, in their external form several striking modifications peculiar to themselves. Of these the most remarkable consists in their tail, which differs in structure from that of every other quadruped. This organ, which is nearly half as long as the body, is broadly dilated, oval, flattened both above and below, covered at its thickened base alone with hair similar to that which invests the rest of the animal, but overlaid throughout the greater part of its extent with a peculiar incrustation which assumes the form of regular scales closely resembling those of fishes. The feet all terminate in five toes, those of the anterior extremities smaller and shorter than those of the posterior and divided almost to the base, while the latter are united to their very tips by the intervention of a strong duplication of the skin, which allows of their separation to a considerable extent and forms a broad and palmated expansion, similar in form and serving for the same useful purpose with the webbed feet of the swimming birds. The nails are thick and strong; and that of the

second toe of the hinder feet is remarkable for being formed of two portions, an upper one corresponding with those of the remaining toes, and an under placed obliquely and having a sharp cutting edge directed downwards.

The gait of the Beavers is waddling and ungraceful, owing partly to the shortness and inequality of their limbs, and partly to the outward direction which is given to their heels to enable their feet more efficiently to fulfil the office of paddles in swimming. The toes alone of the anterior feet, but the whole of the under surface of the sole in the posterior, are applied to the ground in walking. The awkwardness of their appearance in this action is moreover heightened by the clumsiness of their figure, and by the difficulty which they seem to experience in dragging after them their cumbrous tail, which is generally suffered to trail upon the ground, but is sometimes slightly elevated or even curved upwards, and is occasionally moved in a direction from side to side. In the water, however, this member becomes most useful, both as a paddle and a rudder, to urge them onwards and to direct them in their course.

It has often been questioned whether the Beavers of Europe and America constitute two distinct species. M. F. Cuvier has lately pointed out some slight variations in the form and relative dimensions of different portions of the skulls which he had an opportunity of examining; but his observations cannot yet be regarded as conclusive. Other naturalists again have broadly maintained that the solitary and burrowing mode of life of the one, and the social and constructive propensities supposed to be peculiar to the other, alone afforded sufficient grounds of discrimination between them. But numberless instances have shown that these differences

in their modes of life are the natural results of the circumstances in which the animals are respectively placed ; and that the habits of each, in a situation favourable to the change, undergo a thorough revolution. Place the means within his reach, and the constructive instinct of the solitary Beaver becomes fully developed : withdraw those means, and the once skilful builder degenerates into a burrowing hermit. Those of Europe are for the most part met with in the latter predicament, the neighbourhood of civilized man having thinned their numbers and rendered their associations perilous. In America, on the contrary, they form populous villages ; but only in the back and unsettled parts of the country : those which are found on the confines of the different settlements have precisely the same habits with the European animals.

That similar villages formerly existed in various parts of Europe, and more especially in the north, we have abundant proofs in the ruins of these ancient edifices. But it seems to have been too hastily taken for granted that none such are to be found at the present day. In the Transactions of the Berlin Natural History Society for 1829, an extremely interesting account is given by M. de Meyerinck of a colony of Beavers, which has been settled for upwards of a century on a little river called the Nuthe, about half a league above its confluence with the Elbe, in a desert and sequestered canton of the district of Magdeburg. Our author speaks of this little settlement as consisting, in the year 1822, of no more than from fifteen to twenty individuals : but few as they were they executed all the laborious tasks of a much more extensive society. They formed themselves burrows of thirty or forty paces in length, on a level with the stream, with one opening below the surface of the water, and another upon the land ; built

huts eight or ten feet in height, of branches and trunks of trees, laid without any regularity and covered over with soft earth ; and constructed of the same materials a dyke so perfect as to raise the level of the water more than a foot. All their habits indeed as here described coincide so exactly with those of the American Beavers that we should feel some surprise at M. de Meyerinck's assertion that they differed from them in several particulars, and especially in their manner of building, were it not manifest that his ideas of the transatlantic race were gleaned from the relations of those travellers who have indulged their imaginations, instead of relying upon their observations, in all that they have written concerning these singular animals.

The history of the Beaver teems in fact with the most ridiculous exaggerations. Even the absurdities of the ancients have in this instance been exceeded by the credulity of the moderns. The former, indeed, knew the animal only in a state comparatively solitary, and could not therefore attribute to him those ideas of social policy and that settled system of government for which the latter have given him unbounded credit. This delusion, which was perhaps natural enough to those who took but a superficial view of the faculties of this almost mechanical animal, has now, however, passed away ; and the intelligence of the Beaver is recognised as nothing more than a remarkable instinct exerted upon one particular object, and upon that alone. In all respects, except as regards the skill with which he constructs his winter habitation, and the kind of combination into which he enters with his fellows for carrying their common purpose into effect, his intelligence is of the most limited description. He has in fact no need of those artful contrivances to which many animals are compelled to have recourse. His food is

simple, and easily procured. His enemies, man excepted, are few and rarely of a formidable description ; but if surprised by danger, he is quite unable to evade it by the exercise of cunning or sagacity, and his only hope of safety is in flight. It has been said that he is docile in captivity, and may be easily rendered obedient to the commands of his keeper ; but it would appear that his docility is limited to a patient endurance of his condition, and his obedience to a simple recognition of those who take care of him, and whom he may be taught to follow from place to place.

His peculiar conformation renders the Beaver what is commonly, although improperly, termed an amphibious animal, the greater part of his existence being passed in the water, in which he swims and dives with great dexterity. It is for this reason that he always selects for his dwelling-place the banks of rivers or of lakes. Here he lives secluded during the summer in holes which he burrows in the earth, and which he quits only in search of his food and to indulge himself with bathing. But as the autumn advances he begins to look out for society, and to prepare against the rigours and the dearth of winter. With this view he associates himself with a band of his fellows, sometimes amounting in number to two or three hundred ; and the whole body immediately set to work either to repair their old habitations, or, if they have been compelled to desert their former place of abode, to construct new ones on the same plan.

The mode by which this is accomplished has been so repeatedly described by French and English travellers in the northern parts of America that it might seem almost superfluous to enter into any details upon such a subject, were we not well assured that many of the facts vouched for in their relations, and most of the

colouring which has been given to them, have been derived either from the warmth of their imaginations, from partial and imperfect observation, or from the credulous ignorance of their informants. Under these circumstances we cannot do better than recur to the statements of one or two practical men, whose residence in the country and close connexion with the fur trade gave them the best opportunities for obtaining correct information, and whose narratives bear in themselves the stamp of authenticity. Such were Hearne, one of the most intelligent and enterprising agents whom the Hudson's Bay Company ever employed; and Cartwright, who resided for nearly sixteen years on the coast of Labrador for the sole purpose of procuring furs. From the Journals of these two plain-dealing and matter-of-fact men we shall proceed to give the principal facts with which they furnish us relative to the habits of the Beaver in its native state, and to the various modes adopted by the hunters for possessing themselves of its valuable skin.

The situations in which the Beavers build are very various. Sometimes they take up their abode in a pond or a lake, in which the water is tolerably uniform in height and pretty deep immediately under the bank; but they generally make choice of a running stream as more convenient for the conveyance of their materials. They are also said to select in preference the northern side for the advantage of the sun, and the bank of an island, rather than that of the mainland, as affording them greater security from the attacks of their enemies. In this selection, however, their instinct frequently misleads them; for they have been known to build in situations where they have been unable to procure food, and where they have consequently perished from starvation, or to have fixed upon a stream which has been

so swelled by the effects of a heavy thaw as to sweep away not only their magazine of provisions, but sometimes even their habitations.

When the water in the stream is not sufficiently deep for their purpose, or is liable to be diminished by the failure of the supply from above in consequence of frost, they commence their operations by throwing a dam across it below the part which they intend to occupy. In slow rivulets this is made nearly straight; but where the current is strong, it is formed with a curve of greater or less extent, the convexity of which is turned towards the stream. The materials of which this dam is constructed consist of drift wood, and the branches of willows, birch, and poplars, compacted together by mud and stones. The work is raised in the form of a mound, of considerable thickness at the base, and gradually narrowing towards the summit, which is made perfectly level, and of the exact height of the body of water which it is intended to keep up. Cartwright adds that he has frequently crossed the rivers and creeks upon these dams, with only slightly wetting his shoes. The sticks which are used in their construction vary in size from the thickness of a man's finger to that of his ankle; but are seldom larger unless where no others are to be procured. They are mostly obtained from the neighbouring woods, where they are cut with a dexterity truly astonishing. A Beaver, according to Cartwright, will lop off with its teeth at a single effort a stem of the thickness of a common walking-stick, as cleanly as if it had been done by a gardener's pruning-knife. When compelled to have recourse to the larger trunks they gnaw them round and round; always taking care that they shall fall in the direction of the water, in order as much as possible to save themselves carriage. Judging from the number

of large trees sometimes cut down in a season, it would appear that the performance of this operation cannot occupy a very considerable time. As soon as the tree is felled they commence lopping off its branches, which, as well as the smaller trunks, they cut into lengths, according to their weight and thickness. These are dragged in their mouths, and sometimes on their shoulders, to the water-side, where they are thrown into the stream, and towed with the current to their destination.

Exactly the same materials are employed in the construction of their habitations. These are built either immediately beneath the bank, or, if the pool be shallow, at some little distance from it. They begin by hollowing out the bottom, throwing up the mud and stones around it, and intermingling them with such sticks as they can procure. The walls having been thus raised to a sufficient height, the house is covered in with a roof in the shape of a dome, generally emerging about four feet, but sometimes as much as six or seven, from the water. The entrance is made beneath a projection which advances several feet into the stream with a regular descent, terminating at least three feet below the surface to guard against its being frozen up. This is called by the hunters the angle, and a single dwelling is sometimes furnished with two or more. Near the entrance, and on the outside of their houses, the Beavers store up the branches of trees, the bark of which forms their chief subsistence during the winter; and these magazines are sometimes so large as to rise above the surface of the water, and to contain more than a cart-load of provisions.

In all these operations there appears to be no other concert or combination among the Beavers than that which results from a common instinct impelling them to the performance of a common task. The assertion

that they are superintended in their labours by an overseer who gives notice to his workmen when to be at their posts by flapping with his tail upon the water, divides them into parties for each several kind of work, distributes their employments, assigns their stations, and superintends the execution of his commands, is too absurd to require refutation. But there are many other statements regarding them equally untrue, although not at first sight so palpably ridiculous. Thus it is said that their tails are used by them as sledges for the conveyance of their materials, a purpose for which the conformation of this appendage renders it highly improbable that it can serve, and which observation has proved to be performed in a very different manner. But not content with metamorphosing this organ into a sledge, our travellers have also made it a trowel, and have given very particular descriptions of the manner in which the Beaver employs it in spreading the plaster, with which, according to their accounts, his work is overlaid. Unfortunately, however, it is equally unfitted by its structure for such an operation; and the only organs employed in mixing up the mud with the rest of the materials, are the fore-paws and the mouth. These in fact are the instruments with which all the labours of the Beavers are effected; and it is sufficiently obvious that neither with their assistance, nor indeed with the united powers of all their organs, could these animals drive stakes of the thickness of a man's leg three or four feet deep into the ground, or execute a variety of other feats for which they have obtained general credit.

The sticks and branches which they use, instead of being driven into the ground, are laid for the most part in a horizontal direction, and they are only prevented from floating away by the stones and mud which are brought up by the Beavers in their paws from the

bottom to be laid upon them, and which gradually become cemented into a firm and compact mass. All their work is performed during the night. Although the favourable nature of the situation may have induced many families to assemble in the same spot, they do not on that account carry on their operations in common; unless when a dam of large extent is to be built, when they usually unite their forces for its completion. Each family occupies itself exclusively on its own habitation, which has in general but one apartment. The idea of their houses being divided into several chambers, each allotted to its appropriate purpose, may have originated from the fact of their sometimes building by the side of a deserted dwelling, with which they occasionally open a communication. The families vary in the number of individuals of which they are composed, but seldom exceed two or four old ones, and twice as many young; the females producing once a year, from two to three or four at a birth, and the young ones generally quitting their parents at the age of three years, and seeking out or building a separate habitation for themselves.

In summer time they feed either upon the bark of trees or upon the green herbage and the berries which grow in their neighbourhood; but in winter their diet is almost restricted to the former article, of which they lay in a large stock previously to the setting in of the frost. From this store they cut away portions as their necessities require; and after tearing off the bark reject the wood, leaving it to float away with the current. Willow, poplar, and birch, are their favourite kinds, and the latter, according to Cartwright, renders their flesh "the most delicious eating of any animal in the known world." The root of the water-lily also affords them an occasional supply, and makes them very fat, but gives their flesh a strong and unpleasant flavour.

It is not, however, for the delicacy of their flesh, but for the peculiar closeness of their soft and glossy fur that a war of extermination is carried on by man against these peaceful and innoxious beasts. That this fur was at an early period in great request for the manufacture of hats is proved by a proclamation issued in the year 1638, by which it was forbidden to make use of any materials therein except Beaver stuff or Beaver wool. From this time the attention of the North American Indians has been incessantly directed towards these poor animals, and vast quantities have in consequence been destroyed every year. Of the numbers thus sacrificed, and of the importance of the trade, some idea may be formed by the amount of the sales at various places and at different periods. In 1743, the Hudson's Bay Company alone sold 26,750 skins; and 127,080 were imported into Rochelle. Upwards of 170,000 were exported from Canada in 1788; and Quebec alone in 1808 supplied this country with 126,927, which at the estimated average of eighteen shillings and nine pence per skin would produce no less a sum than £118,994.

The skin of the young or Cub-Beaver is the most valuable, as being the darkest and the most glossy; and the winter coat is far superior to the summer. The former season is consequently preferred for taking them, and various means are adopted for the purpose. Sometimes the ice is cut through both above and below their dwellings, nets are thrown across, and the devoted animals are driven from their shelter by the breaking down of their houses, and compelled to enter the nets. Sometimes a number of holes are made in the ice, and they are in like manner driven from their habitations; when, as they are unable to remain under water for any long time, they rise to the surface where the ice is broken, and are easily secured. Under these circumstances they will frequently take refuge in the holes in

the banks, which serve them for summer retreats ; but the experienced hunters readily detect the situation of these vaults by striking with their chisels on the ice, and always select such spots for making their apertures, in which they seldom fail of capturing their victims. In summer it is more usual to take them in their houses by what is termed staking them. For this purpose the hunters first make an aperture in the roof to ascertain the situation of the angle, and having adapted a number of stakes to the opening so as completely to blockade it, cover in the top and leave the stakes on one side ready for use. They then drive the Beavers from all parts of the pond or river by means of dogs ; and when the terrified animals have succeeded in reaching their home, they replace the stakes before the entry, remove the temporary covering from the roof, and either take them alive or spear them in their house. When the sheet of water which they inhabit is merely kept up by a dam, they are still more easily taken by letting off the water, and leaving their huts completely dry. The gun is also sometimes, but not very commonly, used ; and log-traps baited with poplar-sticks occasionally add in a trifling degree to the havoc made among them.

So little is known of the manners of the Beaver in a domesticated state, that we feel a peculiar gratification in having it in our power to give the extremely interesting history of an individual which belonged to Mr. Broderip, to whose kindness we are indebted for the following statement.

“The animal arrived in this country in the winter of 1825, very young, being small and woolly, and without the covering of long hair which marks the adult Beaver. It was the sole survivor of five or six which were shipped at the same time, and it was in a very pitiable condition. Good treatment quickly restored it to health, and kindness soon made it familiar. When called by

its name 'Binny,' it generally answered with a little cry, and came to its owner. The hearth-rug was its favourite haunt, and thereon it would lie stretched out, sometimes on its back, sometimes on its side, and sometimes flat on its belly, but always near its master. The building instinct showed itself immediately it was let out of its cage and materials were placed in its way; and this before it had been a week in its new quarters. Its strength, even before it was half grown, was great. It would drag along a large sweeping-brush, or a warming pan, grasping the handle with its teeth so that the load came over its shoulder, and advancing in an oblique direction till it arrived at the point where it wished to place it. The long and large materials were always taken first, and two of the longest were generally laid cross-wise, with one of the ends of each touching the wall, and the other ends projecting out into the room. The area formed by the crossed brushes and the wall, he would fill up with hand brushes, rush baskets, books, boots, sticks, cloths, dried turf, or any thing portable. As the work grew high, he supported himself on his tail, which propped him up admirably, and he would often, after laying on one of his building materials, sit up over against it, appearing to consider his work, or, as the country people say, 'judge it.' This pause was sometimes followed by changing the position of the material 'judged,' and sometimes it was left in its place. After he had piled up his materials in one part of the room, (for he generally chose the same place), he proceeded to wall up the space between the feet of a chest of drawers which stood, at a little distance from it, high enough on its legs to make the bottom a roof for him; using for this purpose dried turf and sticks, which he laid very even, and filling up the interstices with bits of coal, hay, cloth, or any thing he could pick up. This last place he seemed to

appropriate for his dwelling: the former work seemed to be intended for a dam. When he had walled up the space between the feet of the chest of drawers, he proceeded to carry in sticks, cloths, hay, cotton, and to make a nest; and when he had done he would sit up under the drawers, and comb himself with the nails of his hind feet. In this operation, that which appeared at first to be a mal-formation was shown to be a beautiful adaptation to the necessities of the animal. The huge webbed hind feet of the Beaver turn in so as to give the appearance of deformity; but if the toes were straight, instead of being incurved, the animal could not use them for the purpose of keeping its fur in order, and cleansing it from dirt and moisture.

“Binny generally carried small and light articles between his right fore leg and his chin, walking on the other three legs; and large masses, which he could not grasp readily with his teeth, he pushed forwards leaning against them with his right fore paw and his chin. He never carried any thing on his tail, which he liked to dip in water, but he was not fond of plunging in the whole of his body. If his tail was kept moist he never cared to drink; but if it was kept dry it became hot, and the animal appeared distressed and would drink a great deal. It is not impossible that the tail may have the power of absorbing water, like the skin of frogs, though it must be owned that the scaly integument which invests that member has not much of the character which generally belongs to absorbing surfaces.

“Bread, and bread and milk and sugar, formed the principal part of Binny’s food; but he was very fond of succulent fruits and roots. He was a most entertaining creature, and some highly comic scenes occurred between the worthy, but slow, Beaver, and a light and airy Macauco that was kept in the same apartment.”

An animal so sociable in his habits ought to be affectionate ; and very affectionate the Beaver is said to be. Drage mentions two young ones which were taken alive and brought to a neighbouring factory in Hudson's Bay, where they thrived very fast until one of them was killed accidentally. The survivor instantly felt the loss, began to moan, and abstained from food till it died. Mr. Bullock mentioned to the narrator a similar instance which fell under his notice in North America. A male and female were kept together in a room, where they lived happily till the male was deprived of his partner by death. For a day or two he appeared to be hardly aware of his loss, and brought food and laid it before her : at last, finding that she did not stir, he covered her body with twigs and leaves, and was in a pining state when Mr. Bullock lost sight of him.

The specimens in the Garden were sent to the Society from Canada by Lord Dalhousie. They were partially deprived of sight before their arrival in this country : but one of them has still the use of one eye ; and the other, although totally blind, dives most perseveringly for clay, and applies it to stop up every cranny in their common habitation that can admit "the winter's flaw." They both appear happy and contented.





THE CRESTED PORCUPINE.

HYSTRIX CRISTATA. LINN.

THE entire family of the Porcupines, forming the genus *Hystrix* of Linnæus, are at once distinguished from all other Rodent animals by the peculiar character of their covering, which, instead of being composed of hair alone, consists in a great measure of hollow tubes like the quills of a bird's feathers, generally closed at the extremity and running out into a fine point, but sometimes truncate and open. They have all four cheek teeth on each side of either jaw, furnished with distinct roots, nearly equal in size, irregular but somewhat circular in outline, and presenting in the young state on the surface of their crowns several tubercles of various size and form. As the teeth are worn down in advancing age, these tubercles give rise to as many elliptical layers of enamel occupying the centre of the tooth, while its circumference is marked, both internally

and externally, by a folding inwards of the outer coat. Their tongues are roughened by papillæ similar to those of the cats; their heads generally short and truncate; their nostrils large and open; their ears and eyes comparatively small; and their general form, short, thick, and clumsy.

M. F. Cuvier has lately attempted to subdivide this truly natural family into smaller generic groups, dependent chiefly on his own theoretic notions of the value of the slightest modifications in the form of the skull and teeth in the discrimination of genera. Some variations in the number of toes, and still more remarkable peculiarities in the structure of the tail are brought in aid of this subdivision; but we can scarcely admit the justice of his views unless when supported by a marked difference in the mode of life, such as exists between the burrowing Porcupines of the Old Continent, the arboreal species of North America, and the prehensile-tailed climbers of the South.

The name of *Hystrix* is retained by M. F. Cuvier for the Old Continent group, of which the Common Porcupine is regarded as the type, and of which it is at present the only described species, although it is probable that the Indian and South African animals which have hitherto been confounded with it may hereafter be shown to be distinct. The principal discriminating character of this group is made to consist in the great convexity of its line of profile, the nasal bones being developed to an extraordinary degree. The teeth are more elevated above the level of the jaw, and less irregular in their outline and in the lines of enamel upon the surface of their crowns, than those of the other genera of the family. On the fore feet there are but four distinct toes, the existence of the fifth being indicated only by the presence of its claw; on the

hinder feet their number is five, and they are all of nearly equal size. The claws are short, thick, and formed for digging, a structure intimately connected with the habits of the animals, which live under ground in burrows of their own formation. The tail is extremely short, and the whiskers numerous and of great length.

The common species is almost indiscriminately spoken of as the Italian or African Porcupine, the former name indicating the country in which it is most commonly found at the present day, and the latter that from which it is recorded by the subterranean naturalist Agricola to have been originally imported into Europe. When full grown it measures nearly two feet in length, and some of its longest spines exceed a foot. Its general colour is a grizzled dusky black, resulting from an intermixture of various shades of white, brown, and black. The upper part of its head and neck is furnished with a crest of long lighter coloured hairs capable of being raised or depressed at pleasure. The hair on the muzzle and limbs is very short; on the latter it becomes almost black. On the neck, shoulders, and under parts, it has a brownish hue, and is of considerable length: a whitish band traverses the fore part and sides of the neck. All the remaining parts of the back and sides, including the rump and upper parts of the hinder legs, are armed with spines, which are longest on the centre of the back. These spines are in the middle almost of the thickness of a goose-quill, supported at the base by a slender pedicel, and terminating in very sharp points. They are striated longitudinally and marked by alternate rings of black and white of an inch or more in breadth. Their usual position is lying nearly flat upon the body with their points directed backwards; but when the animal is excited they are

generally raised, by means of the subcutaneous muscles, almost at right angles with the surface to which they are attached, and present a very formidable appearance. They are not, however, it is still necessary to repeat, capable of being detached at pleasure, much less of being darted to a distance; although it is probable that, from the looseness of their attachment, they are occasionally broken off and remain fixed in substances into which they have been thrust. Those of the tail are, as it were, cut off in the middle, and are consequently open at their ends. They produce a loud rustling noise when the animal agitates its tail. Their use, according to M. Thunberg, is very peculiar; but we do not ask of our readers to credit the relation, which merely shows how easily even a respectable naturalist is sometimes imposed upon by his own credulity. He was informed, he says, that the Ceylonese Porcupine "has a very curious method of fetching water for its young, viz. the quills in the tail are said to be hollow, and to have a hole at the extremity; and that the animal can bend them in such a manner as that they can be filled with water, which afterwards is discharged in the nest among the young."

The Porcupine generally sleeps through the day in its solitary burrow, and quits it only in the evening in search of its food, which is almost entirely vegetable, and consists principally of roots, buds, and fruits. Its habitation has usually several distinct openings. It appears that in a state of nature it undergoes a partial hybernation; but this sleep is not of long duration, and it ventures abroad again at the very commencement of the spring. In captivity it is quiet and peaceable, but manifests little inclination to become familiar, and scarcely evinces a shadow of intelligence.



THE FASCICULATED PORCUPINE.

ATHERURA FASCICULATA. Cuv.

ALTHOUGH tolerably described and figured by Buffon, and probably also by Seba, the curious animal above represented had subsequently been lost to science until within less than two years of the present time, when it was recovered almost simultaneously both in its original habitat and in a very distant quarter of the globe. The only notices of which we are aware that have yet been published respecting it, consist of those furnished by the authors just mentioned, of a cursory reference by Sir Stamford Raffles, and of a few words in the late edition of M. Cuvier's *Règne Animal*, in which latter work it is formed into a new genus, on the authority, we presume, of a skeleton and skin transmitted from India by M. Diard in the course of the year 1828. Nearly at the same time a living individual was brought

to England and presented to the Zoological Society by Lieutenant Vidal, who accompanied the expedition for the formation of the projected colony at Fernando Po, where these animals were found in such plenty as to afford a staple article of food to the inhabitants. It has been conjectured, on very probable grounds, that they are not indigenous in the island, but had been brought thither from the East by the Portuguese who were formerly settled there; but the space interposed between the two regions can scarcely be regarded as conclusive evidence of their having been introduced into the colony, while we have such striking instances of animals common to India and the West of Africa as are furnished by the Lion, the Leopard, the Chetah, the Hyæna, and the Ratel.

Leaving this question to be determined by future investigation, we adopt, although not without some hesitation, the views of M. Cuvier, and regard the animal for the present as furnishing the type of a new genus, to which we would add, as a second species, the Landak of Marsden's History of Sumatra. In teeth and in the organs of motion it corresponds, as the distinguished zoologist first quoted informs us, with the Common Porcupine, from which it differs chiefly in the form of the head; the line of its profile, instead of being elevated into a curve of large extent, passing in almost a straight direction from the occiput to the extremity of the nose. In these respects it agrees with M. Frédéric Cuvier's genus *Acanthion*, founded on this very character observed by him on two skulls preserved in the Paris Museum, the one from Java, and the other, in all probability, from Africa. These coincidences would have induced us to consider the two genera as identical, were it not that the Baron Cuvier has omitted all mention of that established by his brother, although the materials

for comparison were fully at his disposal: the latter also, in his recently published genera of Mammalia, enumerates them both: and we must therefore conclude them to be distinct. The remaining generic characters are derived chiefly from the tail, which is elongated to one-third the length of the body, and is covered throughout nearly the whole of its extent by scales disposed in rings, the tip alone being surmounted by a tuft of long flat bristles having the form neither of hairs nor of quills, but bearing a close resemblance, as Buffon has aptly remarked, to narrow slips of parchment cut in an irregular manner.

In the description of his animal Seba has cited Bon-tius as having previously observed it, but the latter author speaks only of a Porcupine in general terms and offers no description, while his figure is evidently from one of the blocks used by Piso for the Coendou in an earlier part of the same miscellaneous volume. On the figure given by Seba, Linnæus founded his *Hystrix macroura*; but Buffon having quoted neither Seba nor Linnæus, Dr. Shaw took it for granted that his was a different animal, and consequently gave it a new name, that of *Hystrix fasciculata*. We entertain, however, but little doubt, notwithstanding some trifling discrepancies in the figures, that Sir Stamford Raffles was right in his conjecture, that they both represent one and the same species. Seba speaks of it as inhabiting the neighbourhood of Celebes, Buffon as a native of the Malayan peninsula, and Sir Stamford Raffles as found in Sumatra.

The differences between this species and the Common Porcupine are obvious at the first glance. Its general colour is nearly the same, but with less intermixture of brown. The upper parts of the body, the outer sides of the limbs, and the head, neck, and face, are of this

dusky hue; but the under parts, inside of the limbs, fore part of the neck, and throat, are of a grayish white, with the exception of a darker band which crosses the breast in front of the fore legs. The spines commence upon the back of the head, where they are little more than an inch in length, and extend to the root of the tail, occupying nearly the whole of the back and sides. The longest are scarcely more than from four to five inches in length. They are mostly white at the base, and black towards the extremity, but many of them are black throughout, and others black above and white beneath. All of them are marked on the upper surface by a deep and broad groove running the whole of their length, and terminate in very sharp points. The skin in which they are implanted appears perfectly white, and where the spines are most numerous, is scarcely furnished with a single hair. A few slenderer spines running out into long black bristles are occasionally intermixed with the others. The greater part of the tail is bare both of hairs and spines, and covered only by flat blackish scales; but its extremity is occupied by the tuft before mentioned, which is of a whitish colour, and about two inches in length. The entire length of the body in our specimen is little more than a foot, and that of the tail from four to five inches. The whiskers are very long; the eyes small and black; and the ears short, round, and naked.

In common with the rest of its tribe the Fasciculated Porcupine sleeps during the day, and becomes in some degree active only on the approach of night. Its intelligence is equally limited, and its manners equally fretful, with those of the common species. Like it, it raises its spines when irritated or disturbed, stamps with its feet upon the floor of its cage, and swells and looks big in its defensive armour.



THE MALABAR SQUIRREL.

SCIURUS MAXIMUS. GMEL.

THERE are few animals of the Rodent Order that can be compared with the Squirrels for the elegance of their form, the beauty of their fur, and the ease, elasticity, and rapidity of their motions. Nestling among the topmost branches of the trees, on which their lives are entirely passed, climbing with extreme agility, and bounding from bough to bough or from tree to tree, with such velocity as almost to elude the sight, they offer in their native state an interesting subject of contemplation; while the mildness of their temper in captivity, the ease with which they suffer themselves to be tamed, and the lively and contented indifference with which they submit to that confinement which is so foreign to their usual habits, have made them universal favourites as domestic pets.

With the true or Tree Squirrels, familiarly known to us by means of the common species that so abundantly inhabits our native woods, Linnæus associated several other groups of animals, some of which, the Dormice for instance, have subsequently been distinguished by common consent, while the rest are still regarded by many naturalists as forming part of the same genus. In fact, were we to rely upon the teeth alone as furnishing the means of subdividing an inconveniently extensive group, we should be compelled to leave in connexion with the Squirrels many species which differ from them most essentially, not only in certain modifications of their outward form, but even in the still more important characters of their habits and mode of life. Thus although we find no appreciable differences in dentition between the Tree Squirrels, the Ground Squirrels, the Flying Squirrels, and the Guerlinguets, we cannot avoid seeing that there exist other distinctions which, combined with the striking discrepancies in their manners, are fully sufficient to justify us in regarding each of these divisions as forming a distinct group. We are consequently compelled to treat of the Squirrels in general not as a genus but as a family, divided into the four genera just enumerated, to which may perhaps be added a fifth for the reception of the Flying Squirrels of the Asiatic Islands, whose dentition is said to present a slight variation from the form common to all the other species of the tribe.

In all the other Squirrels the lower incisors are long, slender, directed forwards, and much more narrow and compressed than the upper, which are strongly curved. The molars are four on each side of either jaw, and nearly equal in size, with their crowns surmounted by elevated lengthened tubercles, variously disposed in those of the upper jaw, and in the lower forming on

each tooth a kind of circular rim surrounding a central depression. There is besides in the upper jaw a small rudimentary tooth, placed anteriorly to the molars, in immediate contact with the inner angle of the first of the series, but falling out at an early age, not to be again produced. Their toes are four in number on the anterior extremities, with a rudiment of a thumb usually supporting a short claw; and five on the posterior, long, slender, and furnished with narrow compressed claws. Their heads are broad and short; their eyes large, prominent, and lively; their ears of middling size; their bodies light and graceful; their limbs of moderate length, the hinder being much the longest; and their tails most commonly nearly equal in length to the entire body, and sometimes even exceeding it. In most of them the tail is truly distichous, the hairs diverging on either side from a middle longitudinal line.

The genus *Sciurus*, restricted to the Tree Squirrels alone, is still a very extensive group. It is principally distinguished by the absence of the lateral folds of the skin which characterize the Flying Squirrels, and of the cheek-pouches which are found in the burrowing *Tamias*, the Ground Squirrels of America; while its distichous tail at once distinguishes it from the *Guerlinguets*. The species are spread over the whole habitable world, with the exception of New Holland, and are generally found in great abundance, living upon the trees, building themselves nests of moss and similar substances, and subsisting upon fruits, and more especially nuts, which they store up in the hollow of a tree, or in some other place of security, for winter provisions.

The Malabar Squirrel is the largest of the tribe, measuring fifteen or sixteen inches from the nose to the root of the tail, which is rather longer than the body;

and standing eight or nine inches in height. On the upper part and the outer sides of the limbs it is of a bright chocolate brown, abruptly changing into a pale yellowish brown on the under parts, fore-arms, and inner sides of the limbs. The front of the fore-legs, the neck, throat, face, and that part of the head which lies between the ears, are of the lighter hue ; the rest of the upper surface of the head being occupied by a broad darker patch extending from the forehead to the middle of the nose. The back and shoulders are occasionally of a deep black. The ears are short, covered with long tufted hairs forming a kind of brush ; and a narrow line of dark brown passes obliquely downwards and backwards from the base of each. The whiskers are few, long, and black. All the claws are strong and incurved, those of the thumbs of the fore-feet being broad, stumpy, and flattened. The tail is broadly distichous, the hairs expanding more widely towards the extremity. It is of a bright chocolate brown at the base, black in the middle, and chestnut in its extreme third.

This splendid species is a native of the Malabar Coast, where it was originally observed by Sonnerat, who figured it in his Voyage. M. Cuvier thinks it probable that it is the animal figured by Pennant in his Indian Zoology, under the name of the Long-tailed Squirrel : his specimen was from Ceylon. It is also figured by Buffon. In its native country it inhabits palm-trees, and is particularly fond of cocoa-nuts and their milky juice.

Our specimen was moderately tame, but excessively fond of gnawing whatever came within its reach. It lived for many months in Bruton Street, where, during a short time, it had a female companion of the same species, which was somewhat smaller than itself.



THE GRAY SQUIRREL.

SCIURUS CINEREUS. LINN.

THE Squirrels of America are by no means equal to those of Eastern Asia in size or in vividness of colouring, although they are for the most part larger than the common European species. Several of them are unquestionably distinct; while others, described as well by American as by European writers, are regarded by many zoologists as mere varieties of the Gray Squirrel, the most common species of the United States. On this subject we shall hereafter have occasion to offer some observations: for the present we confine ourselves to the Gray Squirrel itself, of which two unquestionable specimens exist among the numerous individuals in the Society's Collection.

These specimens are of an ashy gray on the upper surface and sides, each hair being marked by alternate

rings of black and gray. The under surface of the body and inner sides of the limbs are pure white. The tail is nearly equal in length to the body, and when thoroughly developed so completely overshadows it as fully to justify the etymology of the name *Sciurus*, which is even more applicable to the present than to the European species. Both the surfaces of this organ are similar in colour to the back and sides, the under, however, being somewhat lighter; and the long diverging hairs are ringed in such a manner as to give the appearance of an external border of white enclosing a broad band of grayish black. Neither the muzzle nor the sides of the body have any decided tinge of brown; but a very slight intermixture of this colour is visible on the former on a close examination. The ears are covered with very short close-set hairs, and offer no appearance of the bushy pencils which surmount those of the Common Squirrel. In size the American animal is full one-third larger.

This species inhabits nearly the whole of the United States of America, but is found most abundantly in Pennsylvania and the Carolinas. In these states it is met with in immense numbers, living upon buds, shoots, acorns, nuts, and grain; building its summer nest of leaves and twigs in the extreme branches of the trees; and retiring during the winter to the hollow trunks in which it had previously deposited its stores. Its fur is in considerable request, but not, we believe, to the same extent as that of the gray variety of the Common Squirrel, so abundant in the high latitudes of the Old Continent.



THE LESSER AMERICAN FLYING SQUIRREL.

PTEROMYS VOLUCELLA. CUV.

It would be difficult to find in the entire class of Quadrupeds a more graceful little creature, or one better fitted for a lady's pet, than the elegant animal figured above. Its diminutive size, the singularity of its form, the expression of its physiognomy, the vivacity of its motions, and the gentleness of its disposition, all combine to render it one of the most interesting, as well as the most beautiful, of a beautiful and interesting tribe.

The group to which this attractive little animal belongs are, as we have before remarked, principally distinguished from the Common Squirrels by what is usually termed their flying membrane. This apparatus consists of a folding of the skin along either side so as to form broad lateral expansions, supported anteriorly

and posteriorly by the limbs between which they are extended, and by peculiar bony processes arising from the feet. These expansions are not naked and membranous like those of the Bats, but are actual continuations of the skin clothed externally by a dense fur similar to that which invests every other part of the body. Neither do they serve, like the flying membranes of many of the Bats, the purposes of wings; their functions being limited to that of a parachute, giving to the animal a considerable degree of buoyancy, and thus enabling it to take leaps of almost incredible extent, through which it passes with the velocity of an arrow. The name of Flying Squirrels is consequently founded on an erroneous assumption; but it may nevertheless be admitted as a metaphorical expression of their most distinguishing peculiarity.

In this remarkable character the Flying Squirrels of Siberia and North America agree with those of the Asiatic Islands; but the latter, or at least the best known species among them, differ, according to M. F. Cuvier, in some minute particulars of their dentition. The differences which he has observed and figured appear, however, to be little more than might be produced by detrition of the crowns of the teeth; and we cannot therefore regard the genus founded by him upon this single consideration as by any means completely established. At all events we should hesitate in transferring the name of *Pteromys* to the newly distinguished group, and adopting the new term, *Sciuropterus*, proposed by him for the older genus. We say older, inasmuch as it cannot be doubted that, in separating the Flying Squirrels under the former name, his brother Baron Cuvier had chiefly in view the northern species. For this reason we retain the name of *Pteromys* for the present group, whether it be restricted to the latter

animals alone, or extended to embrace the tropical species also.

The Flying Squirrels were but little known to the earlier naturalists. Even down to the time of Linnæus no clear distinction was made between those of America and the Polatouche of Siberia and northern Europe. It was Pallas who first pointed out with precision the actual differences between the latter and the more common of the American species, which had been figured by Buffon under the Polish name in the erroneous idea that it was really the Polatouche. A third species was indicated by Forster in a brief notice of a collection made in Hudson's Bay, published in the *Philosophical Transactions*. This has since been more fully characterized by Dr. Richardson, who, however, appears to be by no means satisfied of the correctness of its separation from the species found in the north of the Old Continent. The same distinguished traveller had himself added a fourth to the list from the valleys of the Rocky Mountains; but he has subsequently reduced it to the rank of a variety only, and offers a guarded opinion that both it and the last may, without much violence, be united to the Polatouche. In that case the Flying Squirrels of the temperate zone would all be still referable to the two species originally established by Pallas. They closely agree in general form with the true Squirrels; but are of smaller size, have rounder heads, and larger and more prominent eyes.

The Lesser Flying Squirrel is little more than half as large as the more northern species, from which it also differs in many particulars of form, colouring, and habits. Its tail is longer in proportion, measuring three-fourths of the length of the head and body; and its head is somewhat more produced in front. On its upper surface the animal is of a bright mouse-colour,

with a tinge of fawn, which is entirely wanting in the other species; the under surface is nearly pure white. The lateral expansions have fawn-coloured margins, bordering a black band; and with only a slight rounded lobe at their anterior extremity on either side. The tail is of the same colour as the body, but more dusky beneath; the eyes are surrounded by broad black circles; the whiskers are long and black; and the ears rather large, somewhat pointed at the tips, and nearly naked on the surface. The length of the head and body never exceeds five inches.

Like the other Squirrels these animals feed on nuts, acorns, and young shoots. Of the former they store up a sufficient quantity for their winter subsistence in their nests, which are built on the trees in a very artificial manner, and are each capable of containing several individuals. They seldom stir out during the day, but become lively and active during the night, foraging in parties of ten or twelve, and bounding from tree to tree with astonishing agility. "They will fly," says Catesby, "four score yards from one tree to another. They cannot rise in their flight, nor keep in a horizontal line, but descend gradually, so that in proportion to the distance the tree they design to fly to is from them, so much the higher they mount on the tree they fly from, that they may reach some part of the tree, even the lowest, rather than fall to the ground, which exposes them to peril. But having once recovered the trunk of a tree, no animal seems nimble enough to take them." In captivity they seem to be perfectly happy and contented, and though shy at first soon become familiar with those who treat them with kindness.



THE BLACK APE.

MACACUS NIGER.

SPECIMENS of this interesting Monkey are of extremely rare occurrence. It was first described by M. Desmarest from a skin in the Paris Museum so imperfect, either in itself or in the manner of its stuffing, as to have induced M. Cuvier to class it among the Baboons. It has consequently been known as the *Cynocephalus niger*, under which name it was figured by Mr. Gray from a specimen formerly living in the Tower Menagerie, but now preserved in the British Museum. A second living specimen has since been exhibited at Exeter 'Change; and the present forms the third instance, as far as we are aware, of its having been brought alive to Europe. Stuffed specimens, in different stages of growth, are, however, we are informed deposited in the extensive Zoological Cabinet at Leyden.

That the animal is truly a *Macacus* cannot be for a

moment doubted by any one who has seen it living. It wants the grand distinction of the Baboons, the only one on which reliance is to be placed, their terminal nostrils; and coincides with the true Macaques in all those traits of which we have before spoken as characteristic of the group. The absence of tail would place it in the same division with the Barbary Ape, forming M. Cuvier's genus *Inuus*, but the physiognomy of the two animals is very different; the fleshy cheeks, and consequent apparent depression of the nose, in the present species, indicating a close affinity to the Mandrills.

Our animal is of a deep jet black in all its parts, with the exception of its large callosities which are flesh-coloured. Its body is covered with long woolly hair, becoming shorter on the limbs. Its ears are small; its tail a mere tubercle, less than an inch in length; and its cheek-pouches seem to be capable of much distension. Its face is broad, rather prominent, slightly narrowing at the muzzle, and abruptly truncate, with the nostrils placed very obliquely on the upper surface. On the top of the head it has a broad tuft of long hairs, falling backwards and forming a very remarkable crest. The expression of its physiognomy is peculiarly cunning. It seems to be rather violent in its temper, and tyrannizes not a little over the quiet Gray Gibbon, which is at present confined in the same cage.

The specimen in the Paris collection was brought, according to M. Desmarest, from one of the islands of the Indian Archipelago; and, according to M. Cuvier, from the Philippines. That in the Gardens is understood to have arrived in England in a vessel from the South Seas, but from what locality it was obtained has not been ascertained.



THE BARBARY APE.

MACACUS SYLVANUS. LACÉP.

By the discovery of the preceding species M. Cuvier's genus *Inuus* has been deprived of the support which it formerly appeared to derive from geographical distribution, being no longer isolated from the Indian Monkeys by its technical character taken from the absence of the tail. The insufficiency of the modifications of this organ alone to characterize the larger divisions of the Monkey tribe has been so clearly established by M. Cuvier, that we cannot but in this instance make use of his own authority against himself, and merge the Barbary Ape in the genus *Macacus*, it being, to use his own expression, "merely a Macaque with a small tubercle in place of a tail." In every essential particular, both of physiognomy and form, the identity of character is too obvious to be overlooked.

The Barbary Ape has been celebrated from the earliest times. It was probably the only tailless species

of Monkey known to the ancient Greeks ; and Galen has left a minute account of its anatomy, which has been of late years verified by the observations of M. de Blainville and M. Cuvier. It is still perhaps more commonly brought to Europe than any other species, the contiguity of its native country, Northern Africa, affording greater facilities for its acquisition, and rendering it more capable of supporting a European climate. It has even established itself on the rock of Gibraltar, where it is said to have become extremely abundant.

On the upper parts of the body and outsides of the limbs it is of a light yellowish brown, becoming somewhat deeper on the head and on a line bordering each of the cheeks. The under parts are of a dull yellowish white ; the face, ears, hands, and callosities, are flesh-coloured. What is called the tail is merely a process of skin, of a thicker substance, totally unconnected with the os coccygis, to which, however, it corresponds in situation. The fingers are moderately long, the ears small, and the muzzle, which becomes more and more prominent as the animal grows older, is broad and flat.

In captivity the Barbary Ape is generally peculiarly lively, active, intelligent, and, in its youth at least, good tempered. But these qualities wear off with advancing age, and it becomes sullen, capricious, and in the end unruly, malicious, and dangerous.





THE AMERICAN TAPIR.

TAPIR AMERICANUS. GMEL.

ALTHOUGH the observation of Buffon, that the Tapir was the largest animal of the New World, has since been proved not to be strictly correct, yet its comparative magnitude and singular form, together with its wide dispersion over the Southern division of the American continent, could not fail to excite the attention even of the earliest travellers who visited the western hemisphere. From almost all of these older writers we have received more or less imperfect accounts of this remarkable creature; but it was not until the close of the last century that its zoological characters were accurately defined and its habits clearly ascertained. For a knowledge of the former we are indebted to M. Geoffroy-Saint-Hilaire, and after him to Baron

Cuvier; our acquaintance with the latter is chiefly derived from the personal observations of Messrs. Sonnini and D'Azara, confirmed by those of later travellers. So incomplete and distorted were all previous accounts that Linnæus himself, after having doubtingly admitted the Tapir into the tenth edition of his *Systema* as a species of *Hippopotamus*, tacitly rejected it from the twelfth, apparently considering its very existence problematical. Buffon, however, had in the mean time received some authentic documents concerning it from La Condamine, and the figure given by him from a drawing by that celebrated traveller furnishes the first tolerable likeness extant. A still better representation was afterwards obtained from a specimen brought alive to France, but which died before reaching Paris, and was published, with additional observations (derived chiefly from the information of M. Sonnini and from a Memoir on the Anatomy of the Tapir by M. Bajon, a surgeon of Cayenne), in the sixth supplementary volume of the great work of Buffon. But many of the original errors of description were still suffered to exist uncontradicted, and even M. Allamand's account of two living specimens in the Menagerie of the Prince of Orange remained imperfect in some of the most essential particulars.

From this time until the commencement of the year 1816, the American Tapir was generally regarded as the only species of its genus. Some vague notices had, it is true, reached Sir Stamford Raffles of the existence of a similar animal in Sumatra and the Malayan Peninsula, but to Major Farquhar belongs the credit of having first procured a specimen and submitted its description to the world at large. The history of this transaction affords too striking an illustration of the injustice of certain among the French zoologists to the

merits of our countrymen to be passed over without observation.

"The knowledge of this animal in France," says M. Desmarest in his *Mammalogie*, carefully shielding himself under an equivocal form of expression, "is due to M. Diard." But M. Lesson goes farther, and echoing as usual the dicta of his predecessor with a slight addition of his own, speaks of the Indian Tapir as a species "discovered by M. Diard." Again, in the *Dictionnaire des Sciences Naturelles*, M. Desmarest, forgetful of his former caution, heightens the farce still more by asserting that its "discovery in the forests of Sumatra and the Peninsula of Malacca is due to MM. Duvaucel and Diard." In none of these works is the least indication given that the animal in question had previously been even seen by an Englishman; much less is the fact suffered to transpire that long before M. Diard had "discovered" it, not in the forests of Sumatra or the Malayan Peninsula, but in the *Ménagerie* of the Governor-General of British India at Barrackpore, a full description, together with a figure of the animal and of its skull, had been laid before the Asiatic Society by Major Farquhar for publication in their *Researches*. This latter circumstance, it is true, was not mentioned by M. Frédéric Cuvier when he figured the Tapir of Malacca in his splendid work from a drawing made by M. Diard in the Barrackpore *Ménagerie*, or by that gentleman himself in the published part of his accompanying letter; but there seems to have been no intention on their parts wilfully to mislead their readers. That M. Diard at least could not have been actuated by any such desire is fully proved by several passages in the note appended by him to Major Farquhar's original description, in which he speaks of the gallant officer as "the excellent naturalist

who has enriched zoology with so important a discovery," and attributes the "honour" to him "alone." Baron Cuvier too, in the recent edition of his *Règne Animal*, silently rejects the unmerited distinction in favour of his step-son and friend, and candidly quotes, as the first describer, our, in this instance, more fortunate countryman. After this we trust that we shall hear no more of the "discovery" of the Indian Tapir by MM. Diard and Duvaucel, who have too many real claims on the consideration of zoologists to require to be tricked out in those borrowed plumes with which it has hitherto been the fashion among our neighbours to invest them.

But it is not in the East alone that a remarkable addition has been made to this singular genus. Within the course of the last year M. Roulin has laid before the French Academy the description, accompanied by figures, of a new species discovered by him in America, and inhabiting the mountainous parts of the same districts of which the older species frequents the plains. A full account of this interesting discovery, with illustrative figures, has since been given in the *Annales des Sciences Naturelles*; and a careful comparison of the different races seems to prove that the Tapir of the mountains is not merely specifically distinct from that of the plains, but that it is even much more closely allied, in its osteology at least, to the oriental species just noticed. We are therefore warranted in considering the genus as at present composed of three species, two American and one Asiatic. Of the latter, as well as of a young animal of the race which forms the subject of the present article, stuffed specimens are preserved in the Society's Museum.

The distinctive characters of this remarkable group may be enumerated as follows. It forms part of the

Pachydermatous tribe, which derives its name from the extreme thickness of skin of the animals that compose it, and which is characterized by the toes being entirely enveloped in inflexible hoofs, and by the want of ruminating stomachs. From all the neighbouring genera the Tapirs differ in their dentition, which is composed of six incisors and two canines in either jaw, and of seven molars in the upper and six in the lower on either side. The two outermost incisors in the upper jaw have sometimes been mistaken, in consequence of their larger size and conical and pointed form, for a second pair of canines, but their insertion in the intermaxillary bone is clearly indicative of their true character. The true canines, which are separated from the incisors by a vacancy of small extent, are almost rudimentary; and those of the opposite jaw, although much larger and more prominent, have no pretensions to the name of tusks. The first of the molar teeth in the upper jaw is small in size and rudimentary in character; and is separated from the canines by a large vacancy. All the remaining molars, both of the upper and lower jaw, are of nearly equal size and similar form, consisting, as a general rule, each of two transverse ridges, which in the upper are united externally and in the lower internally by a longitudinal line.

An error originally introduced by Marcgrave, whose rude cut is accompanied by a neat description, but who speaks of the teeth as consisting of ten incisors and ten molars in each jaw, held its ground for nearly two centuries, and passed successively through the writings of Ray, Brisson, Buffon, Gmelin, and Blumenbach. This was first corrected by M. Geoffroy-Saint-Hilaire; but some confusion seems still to exist upon the subject. In a note to the French translation of D'Azara's *Natural History of the Quadrupeds of Paraguay*, M. Cuvier

tells us that the number of molars in the lower jaw is seven, as in the upper. M. Desmarest repeats this assertion in his *Mammalogie*, and again in the *Dictionnaire des Sciences Naturelles*, but confining it in the latter place to the American species. M. Cuvier, in his *Règne Animal*, probably by a typographical error, which is, however, reproduced in the new edition of that work, is made to say that the number of molars in the Tapirs is twenty-seven. We believe that the statement given above will be found to be correct with respect to all the species. It is that of M. Cuvier in his excellent osteology of the American Tapir, of Sir Everard Home in the *Philosophical Transactions*, of M. Roulin in his late *Memoir*, and of all the authors, from Major Farquhar downwards, who have spoken of the dentition of the Asiatic species. We have ourselves observed the fact in a skull from Sumatra in the Museum of the College of Surgeons; but that of the American species in the same collection not being fully adult has only six cheek-teeth developed in the upper and five in the lower jaw. In a still younger specimen, formerly living in the Gardens of the Society, of the anatomy of which Mr. Yarrell has given many interesting particulars in the fourth volume of the *Zoological Journal*, the number of molars already protruded amounted to no more than four in the upper jaw and three in the lower; but the rudiment of a fifth was discovered in the former on the removal of a portion of the bone, and the very immature age of the animal sufficiently accounts for the apparent deficiency. Both these instances, it will be observed, tend to confirm the opinion that in the American as in the Indian species the lower jaw has one molar tooth less than the upper.

In their general osteology the Tapirs appear to bear a more close resemblance to the *Rhinoceros* than to any

other animal. Their outward form has also in some particulars a near relation to that of the Hog; while on the other hand one peculiarity of structure seems to connect them with the Elephant. In size they are, as Marcgrave well describes the American, about equal to a calf of six months old. They stand moderately high upon the legs, which are thick and strong, the anterior terminating in four toes and the posterior in three, all encased at the point in short rounded hoofs. Their bodies are rather large and heavy, and covered with close, thin, smooth hair; their tails scarcely visible; their ears short, rounded, and open; their eyes extremely small and dull; and the line of their profile long and slightly arched. But their most remarkable feature consists in the prolongation of the nose and upper lip into a moveable proboscis, capable of being protruded for several inches beyond the opening of the mouth, and of being moved at will in various directions. In the extremity of this proboscis the nostrils form two broad transverse fissures. These tubular nostrils are not, however, sufficiently elongated to be used like those of the Elephant for the purpose of inhaling fluids to be afterwards poured down the throat of the animal; neither is the trunk itself furnished with the finger-like appendage which is so highly serviceable to the more bulky quadruped. The comparative brevity of this organ in the Tapir also incapacitates it for the general purposes of prehension; but it seems to be of considerable use, when the animal is feeding, in guiding the food into its mouth, grasping it with some little force, and propelling it onwards towards its destination.

The American Tapir is said to reach six feet in length from the extremity of its proboscis to the origin of its diminutive tail; but the largest of our specimens scarcely exceeds five. Its colour is throughout of a deep brown

approaching to black, with the exception of the sides of the lower lip, a band occupying the middle of the chin beneath, the upper edges of the ears, and a naked line at the junction of the hoofs, all which are purely white. The hair is rather scanty all over the body, very short, and so closely pressed to the surface as hardly to be distinguished at a little distance. The skin beneath it is of great density, being, according to M. Roulin, not less than seven lines in thickness on the back, and eight or nine on the cheeks; and so tough that M. Soncini assures us he has frequently fired at a female Tapir crossing a river with her young, with his gun heavily loaded, without giving her so much disturbance as to cause her to turn aside from her course, although he could distinctly see the impression of his ball upon her skin. On the back of the neck, extending forwards as far as the level of the eyes, is a thick rounded crest, formed internally of a powerful ligament stretched between the spinous processes of the vertebræ of the neck and a strong elevated ridge occupying the line of junction between the parietal bones of the skull. This singular crest is surmounted by a thin mane of stiff blackish hairs. It is peculiar to the present species, but is not found, according to M. Roulin, in its female at Cayenne; although we have D'Azara's authority for the female being equally furnished with it in Paraguay. In the young female, formerly in the Society's Menagerie, which was brought by Lieutenant Maw from Para in Brazil, it was also very conspicuous. The length of the head is very great and is considerably increased by the prolongation of the muzzle, which is covered with hair of the same colour with that of the rest of the body above, and is naked and flesh-coloured at its flattened extremity and beneath. The eyes are extremely small and of a dull lead-colour.

The young is of a much lighter brown than the adult, with numerous small white spots on the checks, a whitish muzzle, and six or eight complete narrow bands of white passing along each side of the body from the shoulders to the haunches. Regular rows of small white spots, placed at equal distances from each other, alternate with these bands. The upper parts of the limbs are marked in a similar manner; their inner sides, as well as the under surface of the body, are white; and their extremities of the ground-colour of the whole body, with a few fainter spots scattered over them. Before the end of the first year of their age this livery becomes completely lost; it is partially visible in the young specimen in the Society's Museum, but not at all in the living individuals at the Gardens. Similar markings occur in the young of the Sumatran species, and also, we may observe, in that of the Hog in its native state. The adult female of the present species has generally a considerable number of whitish hairs intermingled with the brown, which gives her somewhat of a grizzled appearance.

Few animals of equal size have so extensive a range as the American Tapir. It is found in every part of South America to the east of the Andes, from the Straits of Magellan to the Isthmus of Darien; but appears to be most common within the tropics. M. Roulin dwells upon it as a singular fact that although it occurs as low as forty degrees to the south of the equator, it ceases suddenly at about 8° north in a situation where it is extremely abundant, and where no adequate cause has yet been assigned to bar its farther progress, no large rivers nor lofty mountains intervening, nor any change in the character of the vegetation of the country being manifest. The left bank of the Atrato near its mouth, and the part of

Darien inhabited by the independent Indians, may be considered as its northern limit. Its highest range, in the province of Maraquita at least, appears to be from three thousand to three thousand six hundred feet above the level of the sea, while the new species discovered by M. Roulin is only met with at a much greater elevation.

Throughout this wide extent of country the Tapir passes a solitary existence, buried in the depths of the forests and never associating with its fellows; but flying from society and avoiding as much as possible the neighbourhood of man. It rarely stirs abroad from its retreat during the day, which it passes in a state of quiet lethargy; and seeks its food only by night. With the exception of the Hog it seems to be the most truly omnivorous of the tribe of animals to which it belongs, for scarcely any thing comes amiss to its ravenous appetite. Its most common food is vegetable, and consists of wild fruits, buds, and shoots. D'Azara tells us that it is also extremely fond of the barréro or nitrous earth of Paraguay. But when pressed by hunger it swallows whatever comes in its way; and the stomachs of those which are killed in their native forests are commonly filled, according to M. Roulin, with pieces of wood, clay, small stones, and sometimes even bones. A specimen kept by D'Azara gnawed in pieces a silver snuff-box⁴ and swallowed its contents; and some of those which have been confined in Menageries have been known, after a long fast, to devour the worst of all possible filth. In captivity, or when domesticated, it feeds almost indiscriminately on bread, cassava, herbs, roots, fish, and flesh, either raw or cooked; but it still retains its depraved appetite and swallows rags and dirt of all kinds if they are incautiously left within its reach.

The protection afforded by its coat of mail, as its tough skin has been not unaptly termed, together with its great muscular strength, enables the Tapir to penetrate through the most densely compacted underwood with little difficulty. Every thing gives way before its efforts, and thus it soon clears itself a path in whatever direction it chooses to proceed. But when once its path is made it seems to prefer the beaten road to the formation of a new one, and goes backwards and forwards in the same track, which the native huntsmen and travellers always select as the easiest passage through the forest. They are, however, cautious not to remain in it during the night, nor to swing their hammocks across it, as in that case they would be liable to receive considerable injury from the shock of the animal as it rushes past in its nocturnal rambles.

The Tapir is far, however, from being a mischievous animal. In its natural disposition it is remarkably quiet, and never attacks man or beast except in self-defence or under circumstances of great provocation. It is frequently hunted for its flesh, which, although coarse, dry, and unsavoury to a European palate, is regarded as a great luxury by the native Indians and negroes. Its skin is also highly valued on account of its great thickness and strength. The lasso is seldom employed to take it; for it snaps asunder at a single effort a cord strong enough to interrupt a bull in the height of his headlong course. The most common mode of catching them is to attract them by an imitation of their voice, consisting in a sharp but not very shrill whistle, and thus to bring them so close to the huntsman that his shot rarely fails of its effect. The Indians use poisoned arrows for the same purpose. Another plan, which is also frequently pursued, is for the hunters to station themselves towards evening with their dogs by the side of the Tapir's path, to intercept him in his

passage to the water, of which, like most animals of his tribe, he is particularly fond, constantly indulging in a bath as soon as he rouses himself for the business of the night, and wallowing at all times in the water with peculiar delight. The dogs are, however, frequently worsted, the Tapir defending himself with great courage, seizing his enemies with his teeth, and inflicting on them very severe wounds. When thus attacked he usually endeavours to gain the water, where, standing up to his breast, he defies the largest dogs: his assailants being compelled to swim are unable to bring into action their full agility and strength, while the Tapir, quietly watching their motions, seizes them successively as they advance, by the back of their necks, and shakes them off from him with the loss of large portions of their flesh.

It would seem that these animals may be readily tamed, and even to a certain extent domesticated. All those which have been kept in Menageries have been perfectly quiet and good tempered; and M. Sonnini assures us that numerous tame individuals are allowed to walk at liberty through the streets of Cayenne, to leave the town, and to go into the neighbouring woods, from which they return in the evening to the house where they are fed. They are fond, he says, of being noticed, recognise their master, follow him about, and give him various tokens of attachment. "It appears to me," adds M. Sonnini, "that with care and attention the Tapir might be made serviceable as a beast of burthen of great robustness; its thick-set form and the high degree of strength with which it is endowed, would enable it to bear very heavy loads; and the gentleness of its disposition raises a strong presumption that we should find united in it the two valuable qualities of docility and patience."



THE VIRGINIAN FALLOW-DEER.

CERVUS VIRGINIANUS. GMEL.

FEW and strongly marked as are the species of Deer cultivated in our parks, they give name to a genus of the Ruminant Order as natural and almost as extensive as that of the Antelopes, and still more widely distributed over the surface of the habitable globe. Setting aside the great Australian Continent and most of the smaller islands, in which no species of either group has yet been observed, Deer of various kinds are met with in every part of the world, with the single exception of Southern Africa, the head quarters of the Antelopes, whence they appear to be totally excluded by the more favoured race. In those regions where they abound, the savage in his state of nature, the tenant of the wilderness in his first stage of civilization, and the traveller in his pursuit of knowledge through the unexplored

recesses of the forest, all depend upon these animals for their chief subsistence, and find in them their most certain and familiar resource where no other provisions are to be procured. What the ox and the sheep are to settled and civilized man, are the Deer of his native woods to the wild and uncultivated savage.

But it is not merely as a means of subsistence that these animals are hunted down by the tyrants of the creation. The passion of the chase is not one of those passions which are engendered by necessity alone. It glows with equal ardour in the bosoms of the most civilized nations and in those of the most barbarous tribes. In the one as in the other it animates every breast; and it matters little whether it be *panem aut Circenses*, whether food or sport, that the huntsmen seek, the result is the same to the harmless animals that are marked out for their victims. Wherever they exist the Deer seem to be peculiarly destined to this unenviable preeminence, in the one case for their large size and the excellence of their flesh, and in the other for their extreme swiftness of flight.

It might reasonably be imagined that a tribe of animals so familiarly known and affording so many opportunities for examination, would have been studied with the greatest minuteness, and that little would now remain to be learned respecting them. But this is very far indeed from the fact. Except the Rein-deer and the half domesticated races, none of them have been investigated with the accuracy which is requisite to put us in possession of their complete history; and we have consequently a constant accumulation of new species, many of which will unquestionably, on a closer examination, be found scarcely to deserve the name of varieties. This is especially the case with the Indian animals of the *Rusa* tribe, almost every specimen of which that

falls under the notice of naturalists is described as new, in consequence of some trifling variation in its horns, a variation which is frequently replaced in the same individual in the succeeding year by another equally unessential. That these organs furnish the best distinctions that have yet been pointed out we willingly admit; but we feel convinced that the real differences can never be regarded as satisfactorily established until they shall have been traced through the whole course of life. Not to speak of the changes that have been observed in other races, the variations which are known to all as occurring in the European Stag, and those which have been pointed out by M. Cuvier as existing in the Rein-deer of the north, are conspicuous instances of the fallacy of any criterion drawn from individual specimens at an isolated period of their growth.

Not only do the horns of these animals furnish the most readily applicable means of distinguishing the species from each other; they afford moreover almost the only essential characters which, uniting them under one common genus, separate them from the rest of the Ruminant Order. Unlike the horns of the Antelopes, the Goats, the Sheep, and the Oxen, those of the Deer are entirely composed of one homogeneous bony substance, of close and solid texture, and sheathed by no other covering than the soft velvety down which envelopes them during the progress of their growth and disappears as soon as they have reached maturity. Instead of being permanently attached to the skull they are subject to an annual falling off and renewal, the regular recurrence of which is interrupted only under peculiar circumstances of climate or of mutilation. They are besides almost invariably branched in a greater or less degree, except in the first year of their appearance, when they are generally simple; while a similar occur-

rence has only been met with in one or two anomalous cases, and to a very trifling extent, in those groups of Ruminants which are furnished with permanent horns. The generic characters of the Deer may consequently be clearly defined as consisting in their horns of one uniform structure, generally more or less branched, and most commonly deciduous at certain periods. It should however be added that these organs are found in the male alone, except in the single instance of the Reindeer, whose female is provided with the same appendages, but of a less luxuriant growth. It is possible therefore that doubts may occasionally arise relative to the females of certain species either of Deer or of Antelopes, which being themselves destitute of horns, and their males remaining unknown, must be classed by a reference to those characters of general appearance by means of which a very imperfect distinction can be drawn between these nearly related groups. Characters of this latter kind are generally more easily comprehended by a glance at the objects themselves than by pages of unsatisfactory description. We shall therefore merely observe that the Deer resemble the Antelopes very closely in general form, but are usually more strongly made; their legs, although slender, have more muscularity; and their colours are for the most part less vivid. They are also in general of larger size. But all these circumstances are subject to variations in the different species; and no uniform rule can be established with respect to them. In other particulars, such as the elongated form of the head, and its frequent termination in a moist muzzle; the large size of their eyes, and the occasional presence of suborbital fissures; the length of their open and pointed ears; the smoothness of their tongues; and the comparative shortness of their tails; there is little or no distinction between

them. It should, however, be mentioned as an additional characteristic of some of the male Deer, although not common to the entire group nor always uniform even in the same species, that they are provided with canine teeth in the upper jaw ; a peculiarity which has never been met with in any other genus of horned Ruminants.

An illustration of the value of characters derived from general appearance may be found in the animal figured at the head of the present article. Although a female, and consequently without the distinguishing marks of the genus, a stranger to the species could not hesitate a moment in referring it to its proper group. And yet it has scarcely any one of the distinctions indicated above. It is in fact much more slightly made, more graceful in its form, and more lively in its colouring, than the Nyl-ghau Antelope which occupies a part of the same enclosure. It belongs, however, to a well known species of the genus *Cervus*, inhabiting the continent of America from Canada on the north to the banks of the Orinoco on the south. In size it is somewhat superior to our own Fallow Deer, which it much resembles in its general form. The colour of the fawn is a deep tawny sprinkled with scattered white spots, which are lost as the autumn advances. The hair then becomes grayish, and lengthens considerably during the winter, at which period the animal is said by the hunters to be in the gray. At the end of May or the beginning of June the winter coat is shed, and gives place to the short close reddish tawny hair, which lasts until August or September. During the summer months it is said to be in the red. While the latter is again changing to the winter gray, the mixture of the two colours produces a bluish tinge, which the hunters express by saying that the deer is in the blue, at which

period its skin is reckoned the most valuable. Through all these changes the lower jaw, the fore part of the throat, the inside of the ears, the belly, and the inside of the limbs, are white; the face has a grayish tinge; the moist muzzle is of a dusky black, with a white spot on each side of the upper lip; and the lower lip is of a pure white, with the exception of a transverse band of dusky black which crosses it behind the middle. The tail is rather long, tawny above, terminating in black, and white beneath; and a white patch occupies the buttocks beneath the tail, but does not extend beyond its edges. The suborbital fissures consist only of a slight fold of the outer skin; and the muzzle is remarkably slender and pointed. The male has no canine teeth. Its horns, which are cast in January and lose their velvet in September or October, are round, and in the second year (when they first make their appearance) perfectly simple and arched inwards and forwards. In the third year they are furnished with a single antler, rising some distance above the base, and directed inwards. In the fourth a second antler makes its appearance posteriorly near the extremity; and in the fifth, a third is thrown out above the last. In some old bucks the number of antlers amounts to four, one internal, and three posterior. The horns themselves are constantly arched forwards, and their points advance so far anteriorly as to be placed perpendicularly above the muzzle.

The American Fallow-Deer appears to be one of the most abundant species of the group. It lives in numerous herds, and forms a common food of the wild tribes of North America and of the inhabitants of the back settlements. The females are frequently taken during the summer months, by the hunters imitating the cry of the fawn. Their solicitude for their young overcomes their timidity, and they fall victims to their maternal affection.



THE EUROPEAN FOX.

CANIS VULPES. LINN.

It is by no means our intention to enter at length into the history of so common an animal as the European Fox ; but our object being to illustrate, as far as lies in our power, the characters of all the Foxes at present confined in the Society's Menagerie, it becomes necessary to give at least a brief sketch of the most universally known among them, which may serve as a point of comparison for the rest. Before however we proceed to this part of our subject, it will be proper to enumerate the characters by which they are connected with the Dog, Wolf, and Jackal into one common group ; as well as those distinguishing peculiarities on which it has been so repeatedly attempted to institute a separate generic division for the reception of the Foxes alone.

In its most comprehensive sense the genus *Canis* is

distinguished from the other Carnivora by several obvious characters, derived from modifications in the most essential organs. The teeth consist, besides the six incisors and two canines in either jaw common to nearly the whole Order, of three false molars, one lacerator, and two tuberculars on each side of the upper jaw, and of the same number in the lower, with the addition of a fourth rudimentary false molar placed anteriorly to the rest. In no other animals, except in those which are usually referred to this genus, are the tubercular teeth two in number both above and below; the Viverrine groups, which form the nearest approach to them, having but one such tooth in the lower jaw, although furnished with two in the upper. The upper incisors terminate in three more or less deeply indented lobes, while the lower have only two; the canines are strong, conical, pointed, and slightly curved; the false molars gradually increase in size from before backwards, each of the posterior being furnished with an additional lobe; the single points of the upper lacerator, and the double projections of the lower, are continued into sharp cutting edges; and the tuberculars expand into a broad flattened surface. Most of these modifications in the cheek-teeth indicate a diminution of carnivorous propensities in these animals when compared with the Cats, or even with the Weasels, and this is further confirmed by the smoothness of their tongues; but the strength of their canines, and more especially the form of their lacerators, demonstrate that the Dogs are still possessed of a high degree of aptitude for preying upon animal food. Their internal organization is also eminently fitted for the digestion of flesh.

In the organs of locomotion we find similar indications. Their increased length of limb gives to the canine races a superior degree of fleetness in the chase, which

they are enabled to maintain for a great length of time by the strength of their muscles and the firmness of their sinews. Except in one remarkable species, the Hyæna-Dog, which has been separated from the rest as a distinct genus, they have five toes on the fore feet and four only on the hind, the place of the fifth being, however, occasionally marked by a rudimental claw. Each of the toes is armed with a thick, short, blunt, unretractile claw, quite incapable of being used like those of the Cats in seizing their prey, which office is in these animals wholly performed by the teeth. They are equally incapable of being rendered serviceable in climbing trees, a feat which only one species, the Fennec of Bruce, is said to perform; and in this instance our knowledge of the animal is too slight to allow us to ascertain the extent to which this peculiar faculty is carried. In all the species the extremities of the toes, with the broad callous tubercles placed at their base, are the only parts which press upon the ground in walking; and they are consequently as perfectly digitigrade as the Cats themselves.

Of the distinctive characters between the Foxes and the Dogs the most remarkable bears a direct relation to their different modes of life, and seems therefore to furnish an adequate ground for their separation. In the Dogs, however great the intensity of light to which they may be exposed, the iris uniformly contracts around the pupil in the form of a circle; while in the Foxes, if observed during the day or under the influence of a strong light, it is seen to close in a vertical direction, the pupil assuming the figure of a section of a double convex lens. The object of this provision is evidently to exclude the rays of light in a much greater degree than would be compatible with the structure of a circular pupil; and it is consequently only found in those

nocturnal animals in which the faculty of vision is capable of being exercised through the medium of a comparatively small proportion of light. Such animals are necessarily incapable of bearing the full blaze of day, which soon becomes painful to their eyes, thus compelling them to close their pupils to such an extent as to render their vision very imperfect. Much of the cunning suspiciousness of manner for which the Fox is notorious is evidently due to this very circumstance; his attitudes and motions necessarily partake of the uncertainty of his sight, and he appears to be most cunning when he is in reality most short-sighted. To shade himself as much as possible from the light, he hides himself in burrows during the day, and prowls abroad in full possession of his perceptive faculties under the influence of a clouded night.

But although this distinction of nocturnal and diurnal may seem at the first glance to be perfectly natural, a slight acquaintance with the animals to which it is sought to be applied will teach us that its value is in point of fact not so great as theory would lead us to imagine. The Wolf, with a circular pupil, is almost equally nocturnal in its habits with the Foxes themselves; and the Jackal, which both in size and form makes the nearest approach to the latter, and which not only prowls abroad during the night but conceals itself like them in burrows throughout the day, has its iris formed exactly on the same plan with that of the domestic Dog. We cannot therefore consider the habits of the two divisions of the genus to be discriminated in so marked a manner as to justify their separation by means of this character, and still less by means of those minor distinctions which have been thrown as make-weights into the scale.

Of these the most striking is unquestionably the

great difference in their attitudes, the upright bearing of the Wolf and other species of that division, although mingled with a degree of dogged indecision, strongly contrasting with the crouching and almost trailing posture in which the Foxes make their advances. The bodies of the latter seem consequently to be much less elevated upon their legs, and to be even somewhat elongated; and their shoulders and haunches assume a broader and more rounded form. Their heads also are broader and flatter, and terminate in a narrower, shorter, and more pointed muzzle. Their tails are considerably longer, and much more bushy; and their furs, especially the winter coat and in the more northern regions, longer, softer, and far more valuable as an article of commerce. The lobes of the incisor teeth of their upper jaw are not in general so distinctly marked as those of the Dog.

The discrimination of the various species of Foxes which are spread over almost every part of the Old and the New Continent is attended with no little difficulty, in consequence of the great uniformity in size, form, and general disposition of colours subsisting between all the different races. There are, however, in many cases, peculiarities of physiognomy, variations in the character of the fur, and differences in manners sufficiently obvious to the eye of an attentive observer, although, it must be confessed, not very strongly marked. The European Fox is too well known to require minute description, and its distinctive characters will be best understood when we come to compare it with the other species. It will be sufficient for the present to say that its ground colour in its most usual state is of a dull reddish fawn of various degrees of intensity, with a strong tendency to assume a blackish tinge along the middle of the back and across the

shoulders, and an almost constant production of the same hue on the sides of the muzzle, the backs of the ears, the under surface of the tail, and the fore parts of the limbs: the whole of the under surface of the body, the insides of the limbs, the upper lip, and the tip of the tail being most commonly of a pure white. There is much variation in all these particulars, but the general distribution of colours is in all cases pretty nearly the same. In one variety the black of the back and shoulders is strongly developed in the form of a cross; and in another the fawn is much deeper, the fur much closer and longer, and the tip of the tail black instead of white. Similar variations in colouring will be found, as we proceed, to occur also in the other species.

Of the manners of the Fox it would be superfluous to speak in a country where it is so generally known, the extirpation of all the more ferocious beasts having rendered it the most formidable invader of the repose of the poultry-yard, and the primary object of the chase.





THE RED FOX.

CANIS FULVUS. DESM.

WE cannot agree with M. Cuvier in the opinion, founded, we apprehend, on the examination of skins alone, that the Red Fox of America is a mere variety of the common European species. The differences in physiognomy and manners, as well as in general appearance, are too striking, in the living animal, to be regarded, as the great French zoologist appears disposed to consider them, as nothing more than the effects of climate. In point of fact the American animal is by no means confined to those colder regions to which M. Cuvier's observation is expressly limited; for its range extends into the most southern provinces of the United States, where its peculiar characters remain unchanged. The same opinion appears, however, to have prevailed universally among naturalists until the commencement of

the present century, when M. Palisot de Beauvais, in a paper read before the French Institute, (an abstract of which was afterwards given in the *Bulletin de la Société Philomathique*,) first accurately distinguished between the two species. Since that time they have been almost uniformly regarded as distinct; and although much confusion still exists with respect to the American Foxes in general, the present has rarely been confounded with any other.

The distinctive characters of the Red, as compared with the European, Fox, have been so well defined by Dr. Richardson in his *Fauna Boreali-Americana* that we cannot do better than give them in his own words. "On comparing," he says, "a fine specimen of the English Fox with an American Red Fox, each were observed to have dark markings on the sides of the muzzle, posterior parts of the ears, and fore part of the legs; the tails of both have an intermixture of black hairs, and are tipped with white. The Red Fox, however, differs in its long and very fine fur, and in the brilliancy of its colours. Its cheeks are rounder, its nose thicker, shorter, and more truncated. Its eyes are nearer to each other. Its ears are shorter, the hair on its legs is a great deal longer, and its feet are much more woolly beneath, the hair extending beyond the claws, which are shorter than those of the European Fox. In short the Red Fox differs from the European one in nearly the same characters that distinguish the gray American Wolf from the Pyrenean one—in the breadth and capacity of its feet for running on the snow, the quantity of long hair clothing the back part of the cheeks, which in conjunction with the shorter ears and nose give the head a more compact appearance. The Red Fox has a much finer brush than the European one, and is altogether a larger animal."

Several of the peculiarities here enumerated, such as the greater length and fineness of the hair and the woolliness of the feet beneath, which during the winter entirely covers the callous tubercles, are, it is true, nothing more than the usual consequences of a northern climate; and taken alone they would by no means entitle the American animal to be regarded as a distinct species. But the remarkable differences in the form of the head and in the expression of the physiognomy, which can only be properly appreciated on a comparison of living specimens, are, it appears to us, decisive of the question. We have not ourselves had an opportunity of examining the skull of the Red Fox; but if it be correctly described by M. de Beauvais, and after him by M. Desmarest and M. F. Cuvier, it is sufficiently distinguished from that of the common species by the prolongation backwards of the line of attachment of the temporal muscles and by several minor peculiarities. The tip of the tail, it should be observed, is not always white; but it is constantly distinguished by a lighter colour than the rest, and appears never to become black as is sometimes the case in the European species.

The Red Foxes, we are informed by Dr. Richardson, are so abundant in the wooded districts of the Fur Countries that about eight thousand skins are annually imported from thence into England. Like the European Foxes they burrow in the earth during the summer, but prefer the shelter of a fallen tree during the winter, probably because the severity of the climate would expose them to the danger of having their burrows frozen up. They hunt chiefly during the night, and prey upon the smaller animals of the Rodent Order; but they also devour fish and animal food of every kind, and are frequently seen abroad during the day. There seems to be much difficulty in catching them on account

of their extreme suspiciousness, which often renders the precautions of the hunter unavailing. The traps which are set for them are occasionally perfumed with assafœtida, castoreum, and similar substances, of the scent of which the Foxes are said to be fond. When pursued they run for a short distance with great swift-ness, but their wind soon fails and they are speedily overtaken.

The specimen in the Society's Menagerie was presented by the Hudson's Bay Company in the autumn of the last year. It has all the characters of the genuine American race; and we repeat that it seems to us impossible, placing it side by side with the European Fox, not to be convinced that the two animals are of different species. Its manners appear to us indicative of more suspicion, but of a less degree of cunning; but it is almost unnecessary to remark that no certain deduction can be drawn with regard to the character of a species from the observation of a single individual.





THE CROSS FOX.

CANIS FULVUS. Var. *DECUSSATUS.*

IN a group of animals so intimately connected with each other as the Foxes, in which the difference of size is but trifling and that of form depends only on minute peculiarities, while the colouring of each varies most extensively, though always it would seem through a uniform series of gradations, it is next to impossible to determine by the mere inspection of their skins the precise limits of the species. It is therefore not at all surprising that modern zoologists, with M. Geoffroy-Saint-Hilaire at their head, should have looked upon the Cross Fox of America as a distinct species from the Red, from which it differs so remarkably in the colour of its fur. But the observation of living specimens of both in their native country has induced Dr. Richardson to regard the one as a mere variety of the other ;

and the opportunity which we have ourselves had of making a similar comparison in the Society's Menagerie has enabled us to form a decided opinion of the correctness of that gentleman's views upon the subject. On the most careful examination we have been unable to detect any other important difference between them than that which results from their colour; and we are told by Dr. Richardson "that the gradations of colour between characteristic specimens of the Cross and Red Fox are so small, that the hunters are often in doubt with respect to the proper denomination of a skin." Such gradations exist in the excellent series of skins in the Society's Museum; and a similar variation in the European species, from its usual dull tawny to an arrangement of colours exactly corresponding with that of the American Cross Fox, and distinguished by the same name, has been remarked by zoologists from the revival of natural history down to the present day; but although the earlier naturalists, whose ideas of a species were very unsettled, constantly distinguished between these latter races, it seems now to be universally acknowledged that the difference is merely accidental.

The distinguishing peculiarities of the American Cross Fox consist in the dark iron gray of the fore part of its head; the blackish stripe passing from the head along the back and intersected by a similarly coloured band extending downwards over the shoulders; the pale colour of the sides, the tawny occasionally disappearing altogether; and the deep black of the legs and of all the under parts of the body. Its fur is generally considered finer than that of the Red Fox, and the comparative rarity of the animal renders it much more valuable.

In manners and disposition the two animals appear to be precisely similar.



THE SILVER FOX.

CANIS FULVUS. Var. *ARGENTATUS.*

THE Black or Silver Fox of America exhibits a still further deviation from the typical colour of the species to which, in conformity with the opinion of Dr. Richardson, we have referred it without hesitation, notwithstanding that its distinction by M. Geoffroy-Saint-Hilaire has been recognised by Baron Cuvier and almost every zoologist of the day. On this point we can only repeat that we believe them to have formed an erroneous judgment, in consequence of the want of sufficient materials for comparison, the intermediate variety not having, so far as we are aware, been hitherto zoologically studied in a living state in Europe.

From the imperfect means in his possession, M. F. Cuvier some time since conjectured that the Cross and Silver Foxes were varieties of the same species. That

such is really the fact, the black tinge of the former being only still more deeply and more extensively developed in the latter, will, we think be obvious to any one who will take the pains of comparing the specimens of the two animals now occupying the same enclosure in the Gardens of the Society. In this case, as in the last, a similarly coloured Fox is also found, but very rarely, in the North of Europe and of Asia; but we have not been able to ascertain by comparison whether, as is most probable, the latter animal bears the same relation to the Common species.

The gradations between this variety and the last have not been so distinctly marked, in consequence of the extreme rarity of the animal, "a greater number than four or five being seldom," as Dr. Richardson informs us, "taken in a season at any one post in the fur countries." In its most perfect state it is entirely of a pure shining black, with the exception of the tip of the tail, which, as in the other varieties, is white. But more commonly the fore part of the head, the sides of the face, and the loins are grizzled, as in our specimen, by an intermixture of silver-tipped hairs, and there is frequently also, as in it, a white spot upon the breast. Its fur, which is in reality very beautiful, fetches, according to the scientific traveller whom we have so often quoted in our sketches of the American Foxes, six times the price of any other fur produced in North America. It inhabits precisely the same districts as the preceding varieties, whence both it and they were forwarded to England on account of the Hudson's Bay Company, to the liberality of the Governors of which body the Society has been repeatedly indebted for numerous valuable additions both to its Menagerie and Museum.



THE WHITE-CHEEKED MARTEN.

MUSTELA FLAVIGULA. Bodd.

INFERIOR in predatory character to the Cats alone, to which they bear a close resemblance in many points of their organization, the Weasels constitute one of the most strongly marked families among the Carnivora. In slenderness of form, sleekness of fur, and agility of motion, they are excelled by none. Their long narrow cylindrical bodies are supported by short muscular legs, which are usually bent beneath them in such a manner that their bellies appear almost to glide along the ground; while the head and neck, the latter of which is unusually elongated, are of nearly equal diameter with the rest of the body. The upper and anterior part of their heads is flattened and has a somewhat triangular form; their ears are small and rounded; their eyes of moderate size, with round or transversely

elongated pupils ; their nostrils seated at the extremity of a moist glandular muzzle ; their tongues clothed with raised sharp horny papillæ ; and their toes, of which there are five to each foot, armed with long, slender, sharp, curved, semiretractile claws. These claws, although sharp at the points, want the cutting edges possessed by the same organs in the Cats, and are besides but ill calculated by their want of strength for seizing on their prey. They are also incapacitated by the latter circumstance for burrowing in the earth, like those of the Dogs and Bears ; and they seem rather to be of use in climbing trees, a feat which these animals execute with great dexterity, travelling among the branches with such rapidity as to seem rather to fly than to run. They usually remain during the greater part of the day asleep in their retreats, but towards night they begin to rouse themselves and prowl abroad in search of the living victims on which they chiefly feed. In uninhabited districts these are commonly found among the smaller animals of the Rodent Order ; but a still more plentiful supply is frequently derived in cultivated countries from the farm-yard, in which the poultry forms the principal object of their nocturnal incursions. Their visits are sometimes attended with the most extensive devastation, their sanguinary dispositions impelling them to the commission of wholesale destruction for the gratification of their excessive thirst of blood.

In the more typical groups of the family, constituting the major part of the Linnæan genus *Mustela*, the dentition is nearly uniform, and consists most commonly of six incisors and two canines in each jaw ; of two false molars, one lacerator, and one tubercular tooth in the upper jaw, and of three false molars, a lacerator, and a tubercular tooth in the lower. The group, however, for

which M. Cuvier has retained the generic name of *Mustela*, are distinguished from the rest by being furnished with an additional rudimentary false molar in either jaw. Their muzzles are consequently somewhat more lengthened than those of the other divisions. They have also a small tubercle on the inner side of the lower lacerator; and these two characters indicate a trifling diminution in their carnivorous propensities. Their walk is digitigrade, but less completely so than in the Dogs and Cats; and their fur is, generally speaking, remarkable for its length, its fineness, and its gloss.

The fine species which forms the subject of the present article is the largest of the group. It is an animal of extreme rarity, having been well described and figured for the first time by Dr. Horsfield, in the *Zoological Journal*, about twelve months ago, under the name of *Mustela Hardwickii*, from a skin presented by General Hardwicke to the Museum of the East India Company. It had, however, escaped the researches of that excellent zoologist that the living animal had been seen by Pennant so long ago as the year 1774, and was described by him in the first edition of his *History of Quadrupeds*, published in 1781, briefly indeed, but in terms sufficiently precise not to be mistaken. From this description of Pennant, the only writer previous to Dr. Horsfield who appears to have had any personal knowledge of the animal, it was adopted into the compilations of Boddært and Shaw; the former of whom gave it the appellation of *Mustela flavigula*, (which, as the first published Latin name, we have been compelled reluctantly to admit), and the latter designated it as the *Viverra quadricolor*. It seems to have been either passed over, or regarded as doubtful, by all the other compilers of general lists of the Mammalia.

The Society's animal, which we presume to be the

third specimen and second living individual that has been noticed by zoologists, is somewhat darker in its colouring than Dr. Horsfield's figure, the skin from which the latter was taken being in all probability faded; but fully agrees with it in every other particular. It is about two feet in length, with a tail of nearly equal dimensions. The head, nose, and upper lip, the sides of the face including the ears, the back of the neck, the tail and adjacent parts of the body, and the limbs, both within and without, are of a deep shining black. The chin and lower jaw are pure white, and the throat is of a bright yellow, blending on the sides with the brown of the back, the whole of the upper and fore parts of which, together with the belly, are uniformly of the latter colour, except on the shoulders where the hairs are tipped with yellow. The tail is perfectly cylindrical and clothed with long and somewhat rigid hairs. The pupils are round; the ears short; the whiskers moderately long; the palms of the fore feet large and of a dusky colour; and the claws of all nearly white. As far as we have been enabled to examine the teeth, they confirm Dr. Horsfield's conjecture, that the animal is a true *Mustela*. It has the three false molars in the upper jaw which are met with in that genus.

Our specimen is extremely tame, good tempered, playful, and familiar. It partakes in a slight degree of the unpleasant odour remarkable in some other animals of the family, and of which the Polecat affords the most notorious example. It was presented to the Society by the Hon. Captain Shore, by whom it was brought from India. General Hardwicke obtained his skins from Nepaul: the country of Pennant's animal was unknown.



THE PINE MARTEN.

MUSTELA MARTES. BRISS.

THE animals of the Weasel family have long been classed among the torments of zoologists, and few have a better title to be so considered than those which constitute the genus *Mustela*, as restricted by M. Cuvier, and defined in the preceding article. With the exception of the very remarkable species there described, which is incapable of being confounded with any other, the entire group consists of a series of animals approaching each other so closely in all their essential characters, that it is impossible, in the present imperfect state of our knowledge, to determine with precision the limits of the several species which are generally supposed to exist among them, and to which names are universally assigned. Dr. Richardson has lately cleared up some of the difficulties which surrounded the Ame-

rican species, by proving that the Vison (comprehending the *Mustela lutrecephala* of Harlan) belongs to a different group, and pointing out the characteristic features that distinguish the Pekan, (with which he has identified the Fisher-Weasel of Pennant), from the Pine Marten of both continents. But the justice of the separation of the latter from the Beech Marten, and of both from the Sable, still remains open to investigation, with little chance of being speedily or permanently settled. For our own parts we confess that after the most patient and attentive consideration which we have been enabled to bestow upon the subject, aided by the consultation of the best printed authorities, and the examination of numerous specimens, we have been unable to arrive at any satisfactory conclusion. On the one side we have the weight of great names in zoology, as well as the common consent of popular tradition, for regarding the three species just enumerated as distinct; and this opinion is in some degree confirmed by the apparent permanence of certain characters, trifling in themselves, but which have been regarded as sufficiently important to establish a real distinction between them: on the other side we have authorities equally great for considering two at least out of the three as mere varieties of one common species; while the facts that have been observed tend to throw considerable doubt on the permanence of the distinctive marks, and to render it probable that these may be nothing more than the effects of climate, of seasons, of sex, and of age.

It is to be regretted that in subdividing the Linnæan genus *M.* Cuvier should have given the name of *Putorius* to that section which comprehends the Common Weasel, the true *Mustela* of authors, transferring the latter title to the present group, which might have been more appropriately designated by the Latin name of

Martes. By the latter denomination one of the species appears to have been known to the ancients ; but the only instance in which mention of the animal occurs in the Roman classics is in an epigram of the poet Martial. The first notice of their existence among the moderns is found in Albertus Magnus, who speaks of the Beech and Pine Martens and the Sable as distinct, but asserts that the two former breed together ; a fact which, if proved, would go far to establish their identity of origin. The next author in order of time who treats of them, is George Bauer, better known by his assumed name of Agricola, who in his Treatise on Subterraneous Animals, a remarkably correct and well executed performance published at Basil in 1549, refers both the Martens and the Sable to the Weasel genus, and distinguishes the three species in a very particular manner. The first, he says, lives in caves and the fissures of rocks, and is covered all over with blackish tawny hairs, except on the throat, which is pure white. The second rarely quits the shelter of the forest, its colour is more obscurely fulvous, and its throat yellow : of this, he adds, some think there are two kinds, the one living in beech and the other in pine woods. The third is the most beautiful and the most noble, and is called by the Germans Zobel ; it lives in woods, like the Marten, is rather smaller than that animal, and wholly of an obscure tawny, except the throat, which is ash-coloured. The skins of the last, he continues, are more precious than cloth of gold, insomuch that forty of the best quality, which is the quantity usually packed in one bale, have been sold for more than a thousand pieces of gold.

To this accurate account of the animals in question little was added during the two succeeding centuries. It was adopted almost verbatim by Gesner, Aldrovan-

dus, and Jonston. They seem, however, by common consent, to have abandoned Agricola's subdivision of the second species, and to have described his first, the Stone Marten, as it was emphatically denominated by the Germans, as the Beech Marten, imputing to it a more familiar and sociable disposition and a fondness for the neighbourhood of inhabited places. The same distinctions are adopted by Ray in his *Synopsis Quadrupedum*, 1693; but to his description of the Sable he adds, that "Dr. Tancred Robinson had seen the animal itself in the possession of Dr. Charlton. Its size was that of a cat of Cyprus, its colour a dark tawny; the fore part of its head and its ears of a whitish ash-colour; and the bristles on its eyebrows, nose, and face, very long."

So lightly did Linnæus estimate the value of the distinctions indicated between the Pine and Beech Martens, that he uniformly treats of them as one and the same animal, in all his zoological writings from the first edition of his *Fauna Suecica* to the twelfth of his *Systema Naturæ*. It is only in the last that he gives for the first time an intimation of the existence of any difference between them. "The country people," he there says, "reckon two varieties; the Beech Marten with a white throat, and the Pine Marten with a yellow." From the manner in which this observation is introduced it is evident that he gave little credence to the popular opinion. His character of the Sable is principally founded upon that of Ray, and is accompanied by the sign which he constantly used for the purpose of denoting that he had himself never seen the animal. Among his contemporaries, Klein, who in 1751 published an arrangement of Quadrupeds, continues the old distinction, and repeats the old descriptions, of the three species; and Brisson, who followed

in the same track in 1756, but with the advantage of a better knowledge of his subject, distinguishes the Beech and Pine Martens, from his own observation, simply by the colour of their throats, and describes the Sable, which he acknowledges never to have seen, after Ray and the older writers.

In the mean time the great work of Buffon and Daubenton was steadily proceeding in the accumulation of facts, and in their arrangement under a popular and attractive form. Daubenton, who furnished most of the descriptive and all the anatomical details, appears to have been in great doubt whether to regard the Beech and Pine Marten as distinct species, or as mere varieties; and to have been at last determined to consider them in the previous light, by the circumstance that he had never met with a mixed or intermediate breed. "They resemble one another so closely," he says, "in external form and internal structure, that the sole distinction between them consists in the colours of the fur."—"The Pine Marten," he continues, "has the throat yellow, while that of the Beech Marten is white; and the tints of colour are altogether more beautiful, and their lustre more brilliant in the former than in the latter."—"Both," he says, "are found in all kinds of woods, and even in those which have neither firs nor beeches—the Beech Marten is also improperly considered a domestic animal, for although it seeks its prey in inhabited places, it is but little less wild than the Pine Marten." Buffon, on the contrary, finds in their supposed difference of disposition a theme for the exercise of his eloquence, and exaggerates beyond the bounds of probability the fancied contrast between the two animals. Neither Buffon nor Daubenton speak of the Sable as an animal of which they had any personal knowledge; nor is it figured in their work.

In his History of Quadrupeds, Pennant follows Buffon in making the three species distinct. Of the Pine Marten he says that it "never lodges near houses, as the other species is said to do;" but adds in a note, "All foreign authors agree in this; but those [Beech Martens] which inhabit my neighbourhood always keep in the woods, except in their nocturnal excursions." His history of the Sable is fuller than that of previous naturalists, being partly taken from an account of the animal given by John George Gmelin in 1760 in the Memoirs of the Petersburg Academy, and partly from a Collection of Russian Histories, published in German by Müller, and containing many commercial particulars concerning it. Little more is said by our author in his British Zoology respecting the distinction between the two kinds of Marten. He adds, however, that in the Beech Marten "the palms, or under sides of the feet, are covered with a thick down like that on the body;" and "the claws are well adapted for climbing trees, which in this country are its constant residence."

Of all the authors hitherto quoted it will have been observed that none have spoken of the Sable as an animal which they knew otherwise than by report. It is said by most of them to inhabit not only Northern Asia and Russia, but Poland also, Scandinavia, and even Lapland. These latter habitats may, however, probably be considered as indicating nothing more than the countries through the medium of which the skins called Sables were procured. The only two naturalists who have described these animals from personal observation are J. G. Gmelin and Pallas, both of whom became acquainted with them while travelling in Siberia, to which country their range is expressly limited by the latter. The first of these writers had an opportunity of examining two specimens in the palace of the Governor of Siberia at Tobolsk, where they were kept alive for

an entire year. He describes them as resembling the Martens in their form and habit of body: the one being throughout the winter of an ashy black, cinereous on the chin, and yellowish round the ears; the other smaller, and of a yellowish brown, becoming somewhat paler on the chin and ears. On the approach of spring the former animal became yellowish brown, and the latter pale yellow. A figure of the darker coloured specimen accompanies the paper, and well deserves the epithet "*pessima*" applied to it by Pallas. It affords no assistance in the discrimination of the species; but has nevertheless been copied in the *Encyclopédie Méthodique* and many other works, as the truest and most authentic figure of the Sable extant.

In fact, were it not for the authority of the great zoologist to whom we have next to turn our attention, we should scarcely hesitate in discarding the Sable from the list of genuine species, and considering it as a mere variety of the Pine Marten, produced by climate and other concomitant circumstances. But the deliberate judgment of such a man as Pallas, founded on a comparison of specimens both living and dead, carries with it too much weight to be shaken by any but the most positive evidence. In the absence of unquestionable proof to the contrary, we must necessarily take for granted the correctness of his decision, and regard the Siberian Sable as distinguished from the European and Asiatic Martens by the characters which he has pointed out; although these characters are not altogether in accordance with the statements of previous zoologists, and do not appear to have fallen under the notice of any subsequent observer.

The general description of the Sable given by Pallas is accompanied by a comparison of its several parts with those of a Pine Marten found in the same forest,

almost the only one in which the two animals are met with intermixed, and the most western habitat of the true Sable. The distinctive marks of the latter are made to consist in its somewhat larger size; a slight depression of the top of its head; a trifling elongation of its muzzle; the fur of the ears being on the outside excessively soft, pale, and silky, and their inside being lined with whitish hairs; the soles of the feet more villous; the toes not ending in a naked callus, but in a tuft of crisp wool completely enveloping the claws; the tail shorter than the legs when extended, and consequently much more abbreviated than in the Marten, and becoming perfectly black towards the tip; the blackness of the fur of the body, which in the Marten had a yellowish tinge; and the ashy gray of the head, becoming brown on the muzzle, hoary about the eyes, and of a more obscure and dirty colour on the throat, but not abruptly, except in certain varieties, distinguished, like the Marten, by a patch on the throat. Some of these characters, it will be seen, are very trivial, and others susceptible of variation. The slight differences in the form of the head are not greater than are found to exist in the same animal at different ages; and the colour, as we have seen from Gmelin's description, varies greatly in different individuals and in different seasons. The woolliness of the toes, supposed to be peculiar to the Sable, had already been mentioned by Pennant in his description of the Marten, in some specimens of which we have ourselves observed the same fact. And lastly, even the comparative length of tail, on which the greatest stress is laid, affords no absolute criterion; for Pallas himself states that this organ is a little longer in the males, at least when young. His authority must, however, be allowed to overweigh all such considerations; and to indicate the

existence of a true Sable, as a distinct species from the Martens, although unknown to later zoologists.

The history of these animals from the time of Pallas to the present day may be very briefly dismissed. The three species have been almost universally enumerated by authors; but little or nothing has been added to that which was previously known concerning them. Each has copied with more or less correctness that which had been before copied by his predecessors; and the white patch on the throat of the Beech Marten, the yellow on that of the Pine Marten, and the irregularity of these markings in the Sable, together with its woolly toes and shorter tail, have been given by all the best authors as the discriminating marks of the species. Of the more careless compilers some, however, have strangely blundered. Thus, M. Desmarest has omitted the most important characters given by Pallas for the Sable, and has, on his own authority, furnished it with a tail of two-thirds the length of its body, while that of the Pine and Beech Martens is stated to measure but little more than the half. We know of but one instance since Linnæus in which the two latter animals have been even apparently conjoined, and this occurs in a little Essay on the Scottish Mammalia by the late Dr. Walker. He does not, it is true, mention the former, and possibly may not have regarded it as a native of Scotland: he characterizes the species, however, in the words of Linnæus, and observes that, as the animal advances in age, its throat becomes yellower.

Our own observations shall be compressed into as small a space as possible. The individuals figured in our cut were sent from Russia to the late Marchioness of Londonderry as specimens of the true Sable. From this animal, as described by Pallas, they were at once distinguished by the well defined yellow patch spreading

over their chest and throat, and by the length of their tail, which considerably exceeded that of their hinder legs. Their colour during the winter was, with the exception of the throat and the margins of the ears (which were likewise yellow), of a deep chestnut with somewhat of a blackish tinge, and their hair extremely long and fine. The fore legs of one of them were crossed in front towards the upper part by a yellowish stripe. In summer they assumed a much lighter tinge, and their hair became so much shorter as to give them the appearance of being scarcely more than half their former bulk. The extremities of their toes, which had been well protected by lengthened wool throughout the cold weather, were also stripped of their covering and the claws completely exposed. In manners they were lively, active, and good humoured; they slept much during the day, but frequently indulged in whirling themselves, half climbing and half leaping, round the inside of their cage with such rapidity as almost to elude the sight.

The Museum in Bruton Street contains five more specimens of the group, besides those which obviously belong to distinct species from the animals under consideration. Two of these, both British, may fairly be referred to the Beech Marten in its winter and summer dress. The former has the long hairs of a fulvous brown, few in number, and interspersed in a dense cinereous fur; those of the tail and legs are blackish brown; the toes are slightly hairy beneath, but the claws project considerably. The sides of the head are paler, and the throat and chest dirty white, with no intermixture of yellow or brown. In the other the hairs of the body are very short; the fur is much less dense; the general colour is of a paler brown, extending to the legs and tail which are but little darker; the

soles are less hairy; and the top of the head is of the same dirty white colour with the chest and throat. There are also two British specimens of what appears to be the Pine Marten. Neither of them seems to be in its full winter dress; but both are approaching towards it, and in different degrees. They are both darker than the darkest of the former; and there is consequently less difference between the colour of the body and that of the legs and tail. The latter, however, become insensibly deeper and at length nearly black towards their extremities. The upper part and sides of the head are nearly of the same colour with the body; the ears are pale yellow, especially round their margins; the throat and chest marked with a broad well defined patch of yellow with somewhat of an orange tinge; the under part of the toes moderately hairy; but the claws nevertheless distinctly visible. In the fifth specimen, which was brought from the northern parts of America, the general colour is nearly the same with that of the individuals last mentioned; but its tail is considerably shorter, a circumstance which we can scarcely regard as otherwise than accidental in the present instance. The sides of the head are somewhat paler; and the throat, instead of a broad patch of white or yellow, exhibits only a kind of mottled appearance, formed by the intermixture of lighter and darker coloured spots of irregular shape and unequal size. This latter has generally been regarded as a true Sable, and it must be owned that in some of its characters it approaches to Pallas' description; but if it be in reality any thing more than a variety of the Pine Marten, we should rather feel disposed to refer it to the race of Sables mentioned by that author as peculiar to America, and distinguished from those of Asia by their chestnut colour and the inferior quality of their fur. The Pine

Martens are, however, known to vary greatly in the markings of their throat in the fur countries of America, where they are so abundant that upwards of a hundred thousand skins are annually collected.

Such are the specimens of Martens contained in the Society's Museum. Other individuals exhibiting similar variations in their colouring and markings have been observed by us in various collections ; but it would be useless to multiply descriptions leading to no conclusive result. If the Beech and Pine Martens of our own country be distinct, it is probable that the last described animal may also belong to a different species from either. We do not, however, hesitate to declare our opinion that the true Sable of Pallas is still a stranger to our collections ; and we have good reason, in the silence of authors respecting it, for believing that it is equally unknown to the zoologists of the continent. It is certainly not a little singular that an animal so highly valued and so anxiously sought after should still be a desideratum to the scientific world ; but it is perhaps no less so that the opinion which has been so lightly adopted with respect to such well known animals as the indigenous Martens should never yet have been put to the test of direct experiment.





THE REIN-DEER.

CERVUS TARANDUS. LINN.

To the superficial observer, who is contented with a glance at things as they are, and cares little by what agency this state of things has been brought about, it may possibly appear that the various races of domesticated quadrupeds have existed such as they are now, from the creation downwards, the patient and enduring slaves of man, constantly drudging in his service, ministering to his wants, and subservient to his will. But to such an assumption, reason and analogy, past history and present experience, alike afford the most positive and unequivocal contradiction. Every thing tends to prove, beyond the possibility of doubt, that all these races have been gradually reclaimed from a state of nature by the persevering industry of man, who has reaped, in the services which they have been taught to render him, only the just reward of his patience and

his skill. In many cases, it is true, so vast has been the change produced in their characters, both physical and moral, by the cultivation to which they have been subjected, and so innumerable are the varieties to which this cultivation has given rise, that it has at length become almost impossible to refer the domestic races to their prototypes in nature. In others, however, and more especially in those animals which have been uniformly subjected to the same mode of treatment, and confined in a great degree to the countries in which they were originally placed, the change produced by domestication upon their outward appearance has been so trifling, as to render it impossible to call in question their identity with the wild stock from whence they sprung.

Such is the domesticated Rein-deer of the Laplander compared with the free herds that are spread so abundantly through all the habitable parts of the Arctic Regions and the neighbouring countries, extending in the New Continent to a much lower latitude than in the Old, and passing still farther south on all the principal mountain chains. In America the southern limit of the Rein-deer across nearly the whole continent appears to be about the parallel of Quebec, but the animal is most numerous between 63° and 66° . Passing westwards it is said to be unknown in the islands interposed between America and Asia, but is again abundant in Kamtschatka, throughout nearly the whole of Siberia, in Northern Russia, Sweden, and Norway, and more especially in Finmark and Lapland. In these latter countries the numbers of the few wild herds that still exist are suffering a constant diminution, every art being put in practice by the hardy natives to reclaim and domesticate an animal which constitutes their sole property, the source of all their comforts, and the very

means of their existence; without which their land would actually be, as at a first glance it seems, a bleak and uninhabitable desert. According to M. Cuvier, the Baltic forms in Europe its southern limit; in Asia, however, it extends along the Ural chain to the foot of the Caucasus; and we have the authority of a passage in Cæsar's Commentaries, which can scarcely apply to any other animal, for its having existed in his day in the Hercynian Forest. The boundaries of this immense tract of woodland are certainly not very well defined, but this location would imply at all events a more southern European habitat than any that is at present known.

Again crossing the Ocean we find the Rein-deer at Spitzbergen, in Greenland, and in Newfoundland; but it has been said by Pennant, and this has been lately repeated by Dr. Richardson, in his valuable Zoology of the Fur Countries of North America, not to be known in Iceland. This statement, which was scarcely true at the time when Pennant wrote, is not by any means correct as refers to the present day. About sixty years since, as we learn from Von Troil's Letters on Iceland, thirteen of these animals were imported from Norway, ten of which dying on the passage, only three were landed. These were turned out into the mountains, and have since multiplied to such an extent, in the interior and unfrequented parts of the country, that their progeny was estimated by Count Trampe the Governor, in 1809, the period of Dr. Hooker's visit, at no less than five thousand head. Herds of forty, sixty, or even a hundred individuals, are said, both by Dr. Hooker and by Sir George Mackenzie, who visited the island in the following summer, to be not uncommon in the mountains. They are, however, of little use to the inhabitants, who have made no attempts to

domesticate them, and are too poor to purchase powder and ball for their destruction. It does not appear indeed that they are much sought after, the cow and the sheep thriving extremely well upon the island, and supplying the place of the Deer in almost every respect. We may add that, according to Mr., now Sir Arthur, Brooke, an importation of six bucks and twenty-four does took place in 1777, about seven years after the period of the first introduction of the animal into Iceland.

In so wide a range, although not including much diversity of climate, it may reasonably be expected that these animals should be subject to some variation; but all the varieties that have hitherto been pointed out seem to be dependent on size, on trifling modifications of colour, and on the shape and branching of the horns. Thus we are told that in some instances the adult animal has been known to weigh so little as sixty or seventy pounds, while in others it has attained the almost incredible weight of four hundred. In this latter case, however, we cannot help suspecting that there is either gross exaggeration, or some confusion between the Rein-deer and the Elk. The bucks of the smaller American variety weigh, when in good condition, according to Dr. Richardson, from ninety to a hundred and thirty pounds, exclusive of the offal; those of the larger, according to Captain Franklin, from two hundred to two hundred and forty. The laws by which their growth is regulated appear to be directly the reverse of those that govern man and most other animals; for they obviously increase in magnitude the nearer they approach the Pole, and dwindle in the less congenial regions of the south. Those of Norway and Sweden are of diminutive stature when compared with the Deer of Finmark and Lapland;

and these again bear no comparison in size to those of Spitzbergen and the polar climes.

The variations in colour are much less extensive. In summer their coat assumes a deeper hue than in winter; and the young animal has a still darker tinge than the adult. The general colour of the upper parts is of a dark brown, all the hairs being more or less deeply tipped with that colour, and of a grayish white at the base. As the winter approaches the brown assumes a grayish tinge; the whole of the under parts retaining the same shade of grayish white throughout the year. The feet are almost uniformly marked immediately above the hoofs with a band of white. Occasionally the entire coat puts on this white appearance; and spotted or mottled Deer are said to be by no means uncommon in some parts of Lapland, but are still more frequent in Siberia. The fur of the latter is of a finer quality than that of the other varieties. All travellers agree in stating that there is no kind of covering so fitted for the Arctic Regions, or so capable of resisting the most intense cold, as the skin of the Rein-deer. "The hairs composing their coat," says Mr. Brooke, "are indeed so thick, that it is hardly possible by separating them in any way to discern the least portion of the naked hide." This remark had previously been made by Linnæus; and Dr. Richardson affirms that a suit of clothing made of deer-skin "is so impervious to the cold, that, with the addition of a blanket of the same material, any one so clothed may bivouack on the snow with safety, in the most intense cold of an arctic winter's night." The winter clothing of all the tribes inhabiting the arctic circle is consequently almost entirely composed of this inestimable fur.

But the most extensive and the most important variations are those that occur in the horns. In the adult animal these appendages in their most perfect

state give rise to three ramifications ; each terminating in a broad palmated expansion, subdivided into several distinct and more or less elongated processes. The first of these ramifications takes its origin near the root of the horn, and expanding almost from its base, passes forwards over the forehead and root of the nose ; the second rises somewhat higher, but always below the middle of the stem and from its outer side ; and the third terminates the stem itself, which is frequently furnished on its upper part with several short simple snags. But all these particulars are subject to very considerable variations. Sometimes the palmated expansions are no where to be seen, the ramifications terminating in simple cylindrical processes, unconnected by any flattening at their base. This variety most frequently occurs in the young or in the female animal ; for in this species alone of the Deer tribe the female is provided with horns similar to those of the male, but rarely attaining an equal magnitude. Not unfrequently one, or even both the lowermost ramifications, or brow antlers, are entirely wanting. There is also very great variety in size, proportional thickness, and extent of curvature. Every part of them in fact is liable to so much variation that it has been asserted, and not without reason, that no two specimens, even of the same age and sex, have the horns shaped exactly alike. This remarkable fact has been well illustrated by Baron Cuvier, in his *Ossemens Fossiles*, in which he has devoted an entire plate to the modifications in the form of the horns of the Rein-deer as exemplified by the excellent series in the Paris Museum. From these he has deduced the conclusion that there is no character common to the whole species, but that of having the horns smooth and compressed in every part, except in the very short portion immediately connected with the burr. Several conjectural species, founded on these

diversities alone, have thus been erased from our catalogues.

As in all the other species, the horns of the Rein-deer are clothed during their growth with a velvety coat, highly vascular in its structure. At an early period they contain a substance very like marrow, of which the hunters are particularly fond. By the time they have reached their full size, their texture has become perfectly solid and bony, and the velvety coat shrivels up and peels off in ragged and irregular portions. This usually occurs about September; and in two or three months afterwards the old males cast their horns. The young males and the pregnant females generally retain them until the commencement of the spring, but the barren females lose theirs almost as early as the males. The Laplanders say that the more sound and healthy the animal is, the more speedily does it throw off its horns.

Like the Elk, to which it bears a close relation in the palmation of its horns, the Rein-deer is entirely destitute of naked muzzle. In shape, as Cæsar long since remarked, it partakes both of the Ox and of the Stag, resembling the latter in size, in general appearance, and in zoological characters, but in some degree approaching the former in the shape of its head, the shortness and thickness of its neck, the thickset make of its body, and the brevity and muscularity of its limbs. Its head is rarely raised beyond the level of its back, and seems to stoop as it were beneath the weight of its generally ponderous horns. The great strength of its shoulders and forequarters eminently qualifies it for those purposes of draught to which it is most commonly applied by the Laplanders; but it is no less admirably fitted by the muscularity of its loins for a beast of burthen, in which capacity it is frequently made use of by

various Siberian tribes. Instead of the slender feet and narrow pointed hoofs of the Stag, it is furnished with thick bony fetlocks, the joints of which are surrounded by powerful ligaments, and with broad rounded hoofs, capable of being widely expanded, and giving to it the same facility for travelling over the soft and new-fallen snow without sinking, which the natives artificially acquire by means of their snow-shoes. The hoofs are also capable of being widely separated from each other, a provision which adds greatly to the security of their footing by increasing the surface on which they tread.

In a state of nature the Rein-deer is essentially a migratory animal, and so powerful has been its influence on the habits of the pastoral tribes who depend on it for their subsistence, as to have rendered them in this particular subservient to its necessities, and compelled them to adopt a mode of life as unsettled as its own. In the depth of winter it retires to the wooded districts, subsisting principally upon the succulent lichens of the genera *Usnea* and *Alectoria*, which hang in long filamentous tufts from the branches of the trees. With the approach of spring it is gradually tempted to make short trips into the open country, but returns immediately on the recurrence of the frost. In these excursions it finds a change of food in the various species of *Cornicularia*, *Cenomyce*, and *Cetraria* that cover the barren grounds beneath the snow like a carpet, and are from this circumstance collectively known by the name of Rein-deer moss; an appellation appropriated in the north of Europe to one particular species, but equally applicable to the whole. To get at these lichens it scrapes away the snow with its hoofs. As soon as the snows begin to melt, and the woods become infested by the insects of spring, the Rein-deer, fearful of the approaching heats, and anxious to escape from the

attacks of these vermin, and more especially of a species of *cæstrus* or gadfly, which is its own peculiar foe, abandons its covert, and frequently traversing a wide extent of country, migrates in large herds to the sea-shore, or seeks the security of the mountain ridges. Here it subsists partly upon lichens, and partly on the leaves and young shoots of the birch, sallow, and aspen, and on the hay and dry grass that is found in the swamps, until the rigour of the season drives it back into the woods.

A singular circumstance connected with the food of the Rein-deer is mentioned by Mr. Brooke, who attributes to it a propensity for eating lemmings, a small animal about the size of a rat, which comes down in myriads during the summer season from the mountains of the north of Europe. But this is not spoken of as an habitual occurrence; and it is probable that, in the few instances in which it has been observed, it may have arisen from accidental causes, and not from any instinctive fondness for animal food. Such a propensity in a ruminating animal would indeed be an anomaly for which it would be difficult to account. It may be proper, however, to mention that a corroboration of Mr. Brooke's observation is afforded by Capt. Franklin's statement, that the American Rein-deer "are accustomed to gnaw their fallen antlers, and are said to devour mice."

It is only in the Old World that any attempts have been made to domesticate this singularly useful animal. The natives of the northern parts of America appear to have no idea of its value, except as a beast of chase, furnishing them with a considerable portion of their food at certain seasons, and with excellent clothing for the winter. In these points of view the Caribou, as it is termed by the Canadian Voyageurs, is an animal of the highest importance to their domestic economy, and

they have consequently devised various expedients for its capture and destruction, which are minutely detailed by Captains Lyon and Franklin and Dr. Richardson. But there are few of the Siberian tribes to whom these animals are known who do not turn them to better account. The Koriacks possess immense herds of Rein-deer in a state of complete domestication, some of the richest proprietors owning, it is said, as many as ten or even twenty thousands. They use them for the purpose of draught, for their flesh, and for their skins, of which, as we learn from Von Langsdorff and other travellers, they sell great numbers to their neighbours the Kamtschadales, who keep no Rein-deer of their own. The Yakuts and the Samoiedes not only attach them to the sledge, but saddle and mount them as horses. Nothing, however, can more strongly demonstrate the gross ignorance of these barbarous tribes than the fact that throughout the whole of Northern Asia, the milk of the Rein-deer, which the Laplander esteems their most valuable product, is entirely neglected.

It is, in fact, in Lapland alone that the Rein-deer is properly appreciated, and cultivated with a due regard to its peculiar qualifications. To it the Laplander owes whatever he possesses of domestic comfort or of European civilization. It furnishes him with food and raiment; forms the standard of his rank and consideration among his countrymen; and affords the means of communication with his neighbours. In a country where neither the cow nor the horse could live through the winter, it supplies the place of both; and at seasons when the roads, if any existed, would be impassable to man, it whirls him with equal safety and rapidity along the frozen surface of the snow. It is true that in order to obtain these advantages the Laplander is compelled to adapt himself to the manners of his herd, to follow

them in their summer migrations to the coast or to the mountains, and to conduct them on the return of winter to the woods and plains of the interior. But in so doing he relinquishes none of the enjoyments of life; for there is nothing in the desolate country which he inhabits to bind him to one spot more than to another.

It would occupy too much of our space, and would be besides more strictly within the province of the economist than of the naturalist, to give a detailed history of the Rein-deer in its domesticated state. Those who would seek for information on this subject will find much to interest them in the travels of Von Buch, of Dr. Clarke, and more especially of Mr. de Capell Brooke, whose *Winter in Lapland* furnishes a highly graphic sketch both of the Laplander and his Deer. This work contains indeed the most authentic history that we have met with of the domestic Deer, of its powers, its uses, and its mode of treatment; and is in many particulars much fuller of information, and in most of its details more diffuse and circumstantial, than the excellent dissertation published by Linnæus under the name of his pupil Hoffberg, and reprinted in the fourth volume of his invaluable *Amœnitates Academicæ*.

In like manner, and for the same reason, we shall abstain from entering upon the question, so much debated a few years since, of the possibility of the introduction of the Rein-deer into Great Britain, further than to remark that one of the most striking peculiarities in their habits appears to have been entirely lost sight of in the discussion. We allude to their migratory disposition, for which no allowance has been made in any of the attempts to settle them in this country. They appear for the most part to have been turned out into a park or enclosed ground, in which the

lichen was supposed to be sufficiently abundant for their subsistence, and there to have been left to take their chance of life or death, without any farther attention to their wants. It is doubtful, indeed, how far, even in the Highlands of Scotland, it would be possible, with a due regard to the rights of property, to indulge them in their wandering propensities; and we may add that it is no less doubtful whether, in any part of the United Kingdom, the Rein-deer could possibly be put in competition with those other domesticated Ruminants, of which in its native land it is so well fitted to supply the place.

We believe that of all the attempts to acclimate the Rein-deer none has been more successful than that which has been made at the Gardens of the Society. In this instance a single female, of the white variety, has lived and thriven through two successive winters, without suffering any apparent inconvenience from the change of seasons. Her food has been uniformly dry provender; and she has been constantly confined within the same enclosure. We have not met with any other instance in which a Rein-deer kept in such strict confinement has survived during so long a period:





THE AXIS DEER.

CERVUS AXIS. ERXL.

FAR removed from the Rein-deer and other northern species of the genus in character and general appearance, the Axis forms the type of a tribe of Deer, inhabiting the warmer climates of Eastern Asia, and distinguished by the peculiar conformation of their horns. These appendages, in all the species of the Axis or Rusa tribe, are in their adult state furnished with no more than two simple branches or snags, the one originating from the stem near its base, and the other taking its rise considerably above the middle and forming with the continuation of the stem a kind of terminal bifurcation. The horns themselves are either perfectly sessile, or elevated only on short cylindrical processes. Notwithstanding their simplicity and the

general uniformity of their character, they are subject to no little variation in the comparative size, length, and direction of their ramifications; and numerous species have been founded by authors, and in particular by M. Cuvier and M. Blainville, on the most trifling modifications in these particulars. We shall probably have occasion hereafter, in describing another species of the tribe, which has already twice shed its horns during its confinement in the Society's Menagerie, to illustrate by a decisive example the necessity of observing these animals for several successive years, in order to distinguish with precision the characters which are permanent from those which are of a temporary and transitory kind.

The Axis Deer is the earliest and best known species of the Indian group. In size, form, and the general distribution of its colours, it is extremely similar to the Fallow-Deer of Europe, with which it has frequently been compared. So close indeed is the resemblance, that it is sometimes difficult to distinguish between the females of the two races in their summer coat without a minute comparison. In the males the horns alone afford at the first glance a clear and unequivocal mark of distinction. These organs rise almost vertically from the head, take a slight curvature outwards, and turn a little forwards and inwards at their points. The lowermost antler or snag rises close to the base on the anterior surface, and is directed forwards and upwards; the upper takes its origin above the middle and from the inner side. The stems and their branches are perfectly cylindrical throughout, with a somewhat rugged and tubercular surface; and they never form the flattened and palmated expansions which distinguish those of the Fallow-Deer.

To the observations of M. G. Cuvier in the Paris Menagerie we owe an extended comparison between

the Axis and spotted individuals of the Fallow-Deer. In both the colour of the back and sides is fawn spotted with white; a deep brown or blackish band occupies the middle line of the back; and an almost continuous white line passes along either side of the belly between the limbs. But the head, which in the Fallow-Deer is of a uniform grayish brown, is marked in the Axis by a broad dusky spot on the forehead, and a line of the same colour extending along the middle of the nose. The chin and throat of the Axis are pure white, while in the Fallow-Deer they are of nearly the same colour with the chest and under surface of the body, which are both of a grayish hue. The buttocks of the Fallow-Deer are occupied by a broad white patch, separated from the fawn of the back and sides by a black band; and the tail is black above and white beneath. In the Axis the buttocks are of the same colour with the adjacent parts, and the tail is tawny above and white beneath, with a narrow blackish border towards the tip.

Such are the principal differences in colour between the most nearly approximating individuals of the two species; but it is only during the summer that any similarity exists, for the Fallow-Deer changes in winter to a uniform brown, while the Axis retains its spotted livery throughout the year. In form the most remarkable distinctions consist in the rather larger size of the Axis; in the somewhat more elongated and pointed shape of its head; and in the suborbital fissures, which are of large size in the Fallow-Deer, and are of little depth in the Indian species, in which their place is strongly marked by a patch of reddish hairs.

The Axis appears to be common in India and the larger Islands of the Indian Archipelago, but is most abundant in Bengal and on the banks of the Ganges. There can be little doubt that it is the animal mentioned by Pliny, under the name which was adopted

from him by Belon, and employed for it by all subsequent writers. Considerable numbers have been brought to England during the last century, and have thriven extremely well in the menageries, and occasionally in open parks, propagating freely in captivity. It is even stated, on the authority of Peter Collinson, that a mixed progeny has been obtained between them and the Fallow-Deer. They are singularly mild and quiet in their disposition; but their gentleness is not unmixed with timidity, which often degenerates into suspicion. Pennant observes that their sense of smell is so acute that, although fond of bread, which they readily take from the hands of visitors, they will not touch it if it have been previously blown upon; and M. F. Cuvier tells us that they will not even accept it, if it have been much handled. This extreme sensibility of smell and squeamishness of palate is not, however, we may remark, confined to the Axis, but is common to the whole of the Deer and of the Antelopes also.

The Society's specimen, which was a male, lived only for a short time at the Garden, having dislocated its neck, in an attempt, as was supposed, to escape from its enclosure. Its horns had been previously partly broken off; and this deficiency is supplied in our figure from another individual.





THE ITALIAN WOLF-DOG.

CANIS FAMILIARIS. Var. *POMERANUS.*

ALTHOUGH regarded by Buffon, in common with the Shepherd's Dog, as an example of the species in the very lowest stage of cultivation, but one degree removed from a state of nature, the present variety is in fact one of the most intellectual of all the races of Dogs with which we are acquainted. This distinction is solely due, as we apprehend, to the unremitting attention bestowed upon their education. By continued intercourse with man these valuable dogs have become more highly improved, in all that constitutes moral superiority, than almost any other breed; the Newfoundland Dog, the Esquimaux, and the Spaniel, alone evincing an equal share of docility, fidelity, and intelligence.

According to Buffon, the breed in question are denominated Wolf-Dogs, "because they resemble the Wolf in ears and length of hair." Their ears, it is true,

are of small size, and frequently erect; but they have a strong tendency to become pendulous, as is actually the case in the Society's specimens, and thereby approach more closely to the Spaniels. Their hair too is long and straight, but by no means like that of the Wolf; and we can hardly conceive a greater contrast in physiognomy and general appearance than is presented by the two animals. Others again have derived their name from the services which they render to the shepherd in protecting his flock from the nightly marauder; but although strong-built and muscular both in body and limb, they seem too gentle in their disposition to be peculiarly adapted for pulling down so powerful and so ferocious an animal as the Wolf.

They are met with of various colours, black, brown, mixed, or white; but the latter is most frequent. The body is covered with long hair, becoming still longer on the tail, which is long, bushy, and almost constantly curled upwards. The forehead is rather elevated, and, together with the lengthened muzzle, clothed with short close-set hair, as are also the legs. A circle round each eye and the naked part of the muzzle are of a livid flesh-colour.

The individuals at the Gardens were brought from the Campagna di Roma. Their colour is almost purely white.





THE PARNASSIAN SHEEP.

OVIS ARIES. Var. PARNASSIUS.

THERE are two principal difficulties in the natural history of the Sheep, each involving questions of considerable importance, but neither of them admitting, in the present state of our knowledge, of a perfectly satisfactory solution. The first relates to the propriety of the generic distinction between the Sheep and Goats, which naturalists have borrowed from the vulgar classification, adopting it in many instances contrary to their own better judgment. The second has reference to the specific differences supposed to exist between the three or four distinct races that have been found in a state of nature, and to the claims which they severally possess to be regarded as the originals of the domesticated breeds. To these may be added a third, of no less general interest, in some measure dependent upon the

last, but of a still more complicated character, and embracing the combination of circumstances to which each of these breeds is indebted for its own peculiar qualities. The most important part of this inquiry, in an economical point of view, bears reference to the length and texture of the wool, and to its progressive developement, from the African Sheep, in which it is almost entirely wanting, to the Merino, whose fleece is wholly composed of long, thick, and fine wool, to the complete exclusion of the straight stiff hairs which predominate so greatly in the coat of the former breed. On this part of the subject it is by no means our intention to enter; our observations will be confined to those points which come more strictly under the head of natural history.

A comparison of the most common breeds of domesticated Sheep and Goats unquestionably exhibits many striking differences, tending to confirm the broad distinction that has been drawn between them. But these differences vanish almost entirely in those races which still exist in a wild state in various parts of both continents, so that it becomes at length almost impossible to determine to which of the so-called genera many of these animals belong. They all agree in their habits and mode of life, in the details of their internal structure, in form, stature, and general features; in their horns being formed of hollow, wrinkled, angular sheaths, supported by bony processes, having cavities within them communicating with the frontal sinuses; in the number, character, and form of their teeth; in their narrow and elongated muzzles without any naked space surrounding the nostrils; and in the want of the suborbital fissures and brushes to the knees so frequent among the Antelopes and Deer. The only particulars in fact in which they are said generically to differ con-

sist, to quote the definitions of M. Cuvier, in the Sheep having "their horns directed backwards and returning more or less forwards in a spiral manner, with a generally convex line of profile, and no beard;" while the Goats have "their horns directed upwards and backwards, their chins generally decorated with a long beard, and their line of profile almost always concave." To these differences some writers have added the woolly fleeces of the Sheep, and the hairy coverings of the Goats; but all the wild Sheep, and even some of the domesticated races, are clothed with long hair, and many of the cultivated varieties of Goat, those of Thibet and Angora for example, are remarkable for the length and fineness of their wool. The horns too vary so extensively in both cases, and the convexity of the line of profile is subject to so many modifications, as to render the distinctions drawn from these characters of no practical value. On the presence or absence of the beard it would be absurd to dwell as offering the semblance of a generic character, to distinguish between animals which actually produce together a mixed breed capable of continuing their race. From all these considerations we are led to infer that the Sheep and the Goat cannot properly be said to form the types of separate genera.

With regard to the second point, the specific distinction between the different races of Sheep still met with in a state of nature, we have yet formed no decided opinion. It is certainly by no means easy to admit so marked an exception to the general laws that regulate the geographical distribution of animals, as would be involved in the supposition that the same species is found in isolated regions so widely differing from each other as the North of Africa and the South of Europe, the great chain of the Caucasus, the wilds of Tartary and Siberia, and the Rocky Mountains of North Ame-

rica. And yet the distinguishing characters of each are in themselves so trivial, and the races pass into one another by such insensible gradations, especially when connected by means of the domesticated breeds, and propagate so readily a mixed breed, that we cannot but entertain doubts of the propriety of their separation from each other. That the Moufflon of Corsica is the parent stock from which were derived most of the European breeds, has been proved almost to demonstration; and the origin of the Asiatic races (as numerous as the European, but not separable from them by any tangible characters) from the Siberian Argali is equally certain. With the latter many distinguished zoologists maintain that the Rocky Mountain Sheep is in all respects identical. This question, therefore, like that of the origin and specific identity of the Dog, whose varieties are scarcely more numerous or more striking than those of the Sheep, still remains, and in all probability will ever continue, open to discussion.

The fine Ram figured at the head of the present article is the only specimen that we have seen of a beautiful domesticated breed. In the large size, spiral twist, and lateral extension of its horns, it comes nearest to the Merino, which, however, it considerably exceeds in all these particulars. It differs too most essentially in the character of its wool, which instead of being curled and tufted, is perfectly straight, and of very great length, that which is derived from the middle of the back falling on either side of the animal almost to the ground: it is also very close set and beautifully fine. The animal in question came from Mount Parnassus, and was presented to the Society by Dr. Bowring. It is, like the Sheep in general, extremely stupid, but at the same time vicious and unruly,



THE FOUR-HORNED SHEEP.

OVIS ARIES. Var. *POLYCERATA.*

ONE of the most curious modifications produced by cultivation in the domesticated Sheep consists in the augmentation of the number of its horns ; two, three, or even four supplementary appendages of this description being occasionally produced in addition to the normal number. Under these circumstances the additional horns usually occupy the upper and fore part of the head, and are of a more slender shape and take a more upright direction than the others, thus approaching in character to those of the Goats, while the true horns retain more or less of the spiral curve that distinguishes those of the Sheep. There exists a strong tendency to the hereditary propagation of this monstrosity, which is extremely frequent in the Asiatic races,

but is also met with in a breed that is common in the North of Europe, and is said to have been originally derived from Iceland and the Feroe Islands. In the latter case it is unconnected with any other anomaly; but in the flocks of the nomad hordes of Tartary it is usually combined with an enlargement of the tail and adjacent parts, by the deposition of fat, frequently to an enormous extent. Specimens of both varieties, separate and combined, have formed part of the Society's Collection at the Farm on Kingston Hill, to which most of the domesticated animals were removed during the summer of 1829.

The specimen figured is remarkable only for the number of its horns. The lateral or true horns rise from their usual point of attachment, and describe a spiral curve round the animal's ears. The accessory horns, two in number, take their origin more internally and between the others, and pass almost directly upwards, inclining, as they advance, in a direction forwards and outwards.





THE VIRGINIAN OPOSSUM.

DIDELPHIS VIRGINIANA. CUV.

THE further we advance in our knowledge of Marsupial animals, the more firmly do we become convinced of the impropriety of their separation as a distinct and isolated group. When we see that the single peculiarity that unites them is bestowed upon types of form so widely different from each other, we cannot consider this simple metastasis of function in a certain set of organs alone, however great the importance of that function in the animal economy, as furnishing sufficient ground for the overthrow of every principle of classification, and for setting at nought some of the most strongly marked affinities that the animal kingdom affords. How striking, for instance, is the passage from the Insectivorous Carnivora, through the Opossums and *Dasyuri*, to the Civets and other more purely

Carnivorous groups ! What is there of importance in the structure of the Wombat, the Phascolomys of M. Geoffroy, except this solitary character of the marsupium, to separate it from the Rodent Order ? And what other character can be found to justify even in appearance the union of any of the animals just named with the Kangaroos ? It is obvious that a tribe formed of such discordant materials cannot be natural, and the animals of which it is composed imperatively require to be distributed in more strict conformity with the general laws of their organization. The anomalous character of many of them undoubtedly presents a formidable obstacle to their classification ; but we entertain a confident belief that a more intimate acquaintance with their structure than we yet possess will, at no very distant period, lead to their complete and homogeneous amalgamation with the general mass, of which they form integral, although at present dislocated, parts.

In such an arrangement the place of the Opossums, as we have before intimated, cannot be mistaken. Together with the Dasyuri, their representatives in New Holland, they would occupy a station intermediate between the Insectivora and the Civets, with the latter of which they are no less closely connected in their habits than in their general form and in the character of their dentition. In this last particular, which must always be regarded as of the highest importance, the forms of the teeth are so modified in the Opossums as to effect a considerable diminution of the carnivorous character ; while the increase of their number, which surpasses that of any other quadruped, also contributes to the same end. They consist of ten incisors in the upper jaw and eight in the lower ; of two canines both above and below ; and of seven cheek-teeth on each side of either jaw ; making in the whole, when the

dentition is perfect, no less than fifty teeth. The two middle incisors, of the upper jaw more particularly, are separated from the rest by a slight vacancy, and are consequently more prominent; they are also somewhat longer. The canines are strong, compressed, and incurved, the upper being considerably larger than the lower. Of the cheek-teeth, the three anterior in each jaw are false molars, each forming a simple compressed conical point; the remainder are true molars, surmounted, as in most of the insectivorous groups, by sharp-pointed tubercles, but closely approximating in their outline and disposition to the lacerators and tubercular teeth found in the Civets and neighbouring genera.

In the form of their bodies they also bear a close resemblance to the animals just mentioned; their head is long and pointed; the line of their profile nearly straight; their ears large and naked; their eyes small, but expressive; their mouth deeply cut and with a wide gape; and their tongues roughened with horny papillæ. Their tails are long and tapering, covered with long hair at the base alone, and with scales throughout the remaining part, which is extremely flexible and strongly prehensile. Their legs are rather short: on the fore feet are five toes, all of them terminating in strong sharp curved claws; the hinder feet have the thumb separated from the rest, distinctly opposable as in the Monkeys, and entirely destitute of nail or claw. The claws of the other toes correspond exactly with those of the anterior extremities.

The Opossums are exclusively natives of America, and are the only Marsupial animals that exist beyond the pale of New Holland and the neighbouring Archipelagoes. They seem to fill in the New World to a certain extent the same station with the Civets of the

Old; for no species of this latter family has yet been discovered in the Western Hemisphere. Like them they secrete a strongly odoriferous fluid, pass the day in a state approaching to torpidity, prowl abroad during the night, and prey upon birds and the smaller quadrupeds, frequently making the poultry-yard the scene of their devastations, and sucking the blood of their victim before gorging themselves upon its flesh. In the absence of more noble game, they make prey even of reptiles and insects; and fruits and other vegetable substances afford a common addition to their varied diet. But unlike the Civets they live almost entirely upon the trees, the peculiar conformation of their hinder hands, and the prehensile character of their naked tail, rendering them most admirable climbers. These tails are also of essential service in another point of view, the little ones when frightened leaping upon their mother's back, twisting their tails round hers, and in this singular fashion escaping with her assistance from the threatened danger.

The Virginian Opossum is one of the largest species of the group, being in size fully equal to the domestic Cat. It belongs to that division of the genus in which the pouch beneath the belly of the adult females forms a perfect sac, completely enclosing the young from the period when they first become attached to the teat until they are able to shift for themselves. Its general colour is of a dull white, the hair with which it is covered being of two different kinds. That which more immediately invests the body is a long, fine, woolly down, white at the base with brownish tips; through which pass the still longer hairs of a pure white from which the colour of the animal is principally derived. On the head, neck, and under parts of the body the hair is short and close; a brownish circle surrounds each eye;

and the legs are of a deep chestnut brown. The whiskers are long, partly white and partly reddish; the extremity of the nose flesh-coloured with a tinge of yellow; and the ears generally black at the base and yellowish at the tip. The tail is considerably shorter than the body; its base is covered by long hairs, but the greater part of its length is only scantily supplied with short bristles which emerge from between the small whitish scales by which it is protected. The young are of a purer white than the full-grown animal.

This is the only species, with the exception of the Mexican Cayopollin, that inhabits North America. It is extremely abundant in the North of Mexico, and throughout nearly the whole of the United States; and has consequently formed the subject of most of the experiments that have been instituted for the solution of the yet incompletely penetrated mystery of the breeding and gestation of marsupial animals. Little is known concerning the latter point beyond the curious facts that the almost shapeless young, of scarcely more than a grain in weight, and generally about twelve in number, are found at first inseparably attached to the teats within the pouch; that as they increase in size the teats become proportionally enlarged and are prolonged into the stomachs of the young; that after a certain number of days, having attained about the size of a mouse, and all their parts being completely formed, they abandon the teats, to which they thenceforward only return like other suckling animals to satisfy the cravings of their appetites, occasionally quitting the pouch itself, but still flying to it for shelter on the slightest alarm; and that they finally abandon it also at the end of about fifty days from the period when they were first deposited within it. In what manner this deposition takes place, and what is the object that

nature seeks to attain by so anomalous a formation, are secrets that still remain to be unravelled.

In its native state the Virginian Opossum has all the habits that are characteristic of the group to which it belongs. It lives in trees, feeds on birds, insects, and fruit, and sometimes carries its attacks into the neighbouring farm-yards. In captivity it is listless, indolent, and careless of the objects by which it is surrounded; but is snappish when disturbed, and evinces no disposition towards familiarity.





THE CRAB-EATING OPOSSUM.

DIDELPHIS CANCRIVORA. GMEL.

IN its adult state the Crab-eating Opossum attains a size fully equal to the Virginian species. Its head and muzzle are much more elongated; and its tail exceeds the length of its body and head combined. The general colour of its fur is blackish brown, the fine down being entirely of a dull white, and the long stiff hairs white at the base and of a deep brown approaching to black towards their extremities. The head and legs are covered with short close hair, the former of a pale blackish brown, deeper on the middle line, and the latter pure black. The under parts have a light tawny tinge. The long slender muzzle usually terminates in a black tip, but in our specimen, as well as in that figured by M. F. Cuvier, this part is flesh-coloured. The ears are generally of a yellowish white throughout.

The tail is covered at its base with hair of the same nature with that which invests the body; the succeeding portion is coated with black scales, with a few short intervening black hairs; and the remainder with whitish or flesh-coloured scales and similarly coloured hairs. The point is remarkably long and tapering.

This species appears to be the most common of those which inhabit South America. It is found in great plenty in Guiana and Brasil, climbing trees with facility, but running slowly and with an ill grace. It prefers marshy situations or the neighbourhood of the sea-coast, and feeds like the other species indiscriminately on the smaller quadrupeds, birds, reptiles, insects, and fruits. But it is said also to have a particular fondness for crabs, whence the derivation of its name. Its flesh is commonly eaten by the natives, who assert that it is similar in flavour to that of the hare. In captivity it is as stupid as the preceding species, offering no resistance, but rarely familiarizing itself with its keepers, and seldom exhibiting any signs of vivacity except a snarling pettishness when disturbed.





THE BROWN LLAMA.

AUCHENIA GLAMA. ILLIG.

THE study of the mutual relations of organs and of functions, not only of such as are obviously connected with each other, but of those between which there appears at the first glance to be no bond of connexion whatever, is one of the most curious that can occupy the attention of the zoologist. It has been remarked by M. Cuvier, that no process of reasoning *a priori* could have led to the conclusion that a parted hoof necessarily implied the existence of ruminating stomachs; but the universality of the fact, ascertained by observation, compels us to admit that this mutual dependence of parts having no immediate relationship with each other is the work of an overruling power, acting upon a uniform system, and in pursuance of a definite design. The form and structure of the horny

appendages which terminate the feet of quadrupeds bear indeed, in most cases, a determinate relation to the quality of their food, and to their means of procuring it; and there are few instances in which the experienced anatomist would not be enabled, from the examination of the nail, the claw, or the hoof alone, to indicate at least the general characters of the intestinal canal of the animals to which they might respectively belong.

There are, however, few general laws that do not admit of some exceptions; and an ingenious writer of the present day has fancied that he has found one to the rule in question in the Hogs, which, in common with the older naturalists, he considers as "*quadrupeda bisulca non ruminantia*." But the slightest examination of these organs will suffice to prove that the hoofs of the Hogs differ as essentially from those of Ruminant Quadrupeds as their stomachs; and that these animals form in both respects the passage between the Ruminating and Pachydermatous tribes, although they are much more closely allied to the latter. We believe that there does not exist an instance in which the true parted hoof is found independent of rumination; although the converse of this proposition cannot be maintained with equal strictness.

The exceptions to which we now allude are found in the Llamas and the Camels, which alone of all the Ruminants have their hoofs formed on a different plan from that which generally pervades the tribe. Instead of having short and abruptly truncated toes, completely enveloped in large hoofs, flattened internally, and forming the sole basis on which the animal rests in progression, these groups have their toes elongated forwards and terminating in small horny appendages, surrounding the last phalanx alone, rounded above and on either side, and somewhat curved, while the under surface of

the foot on which they tread is covered only by a thickened callous skin. This striking deviation from the typical form is not, however, unaccompanied by differences in the structure of the stomachs, which, although truly and essentially ruminant, have in this case an additional developement of a very remarkable character. One of the most useful peculiarities of the Camel, its power of passing many days without drinking, has long since been recognised as dependent on a cellular apparatus connected with the first and second stomachs, and capable, to quote the expressions of M. Cuvier, "of retaining water or of continually producing it." But the existence of a similar apparatus in the stomach of the Llamas has been repeatedly denied: Feuillée, in his minute account of the anatomy of this organ, takes no notice of such an appendage, and Sir Everard Home expressly states that the corresponding pits in the stomach of the Llama "have no depth, are only superficial cells, and have no muscular apparatus to close their mouths." From an external examination of the stomach of a Llama we had been induced to believe that its cells were of considerable depth; and Dr. Knox has recently confirmed this opinion in a paper published in the *Edinburgh Journal of Natural and Geographical Science*, where he has shown that the actual differences between the stomachs of the Llama and the Camel are much less than had previously been imagined. Hence we are authorized in inferring that the Llamas, which are known to possess a similar capability of resisting thirst, are furnished with the same means of providing against its effects.

The Camels and the Llamas differ from the rest of the Ruminants in several other striking particulars. They are entirely destitute of horns, an exemption which they share with the genus *Moschus*, as at pre-

sent constituted, and which, according to some writers, is compensated by the presence of two incisor teeth in the upper jaw, which they alone possess, and by the greater developement of the canine teeth in the same jaw, which they exhibit in common with many others of the tribe. Their dentition is in fact peculiar to themselves. The real character of the incisors of the upper jaw is indicated only by their position in the intermaxillary bone, for they are placed at some distance from each other and have exactly the shape of canines; the true canines are considerably larger; and the cheek-teeth form a regular series like those of the generality of Ruminants, but consisting of only two false and three true molars. In the lower jaw there are but six incisors, the two outermost of the series having all the character of canines, and being fully as large as those of the upper; and the cheek-teeth consist of but one false molar and three true ones. The Camels have in addition a small rudimentary false molar, having the conical form of the canines, and placed in the interval between the latter and the cheek-teeth, on each side of either jaw.

Of the remaining characters common to the Camels and the Llamas the most important are the length of the neck; the comparatively small size of the head; the prolongation and mobility of the upper lip, which is deeply divided by a vertical fissure; and the want of a naked muzzle, the openings of the nostrils forming merely two transverse fissures in the skin, capable of being closed at pleasure. The distinguishing characters between the two groups are chiefly founded on the difference in dentition just noticed; on the presence of a broad callous sole connecting the toes of the Camels beneath, which is wanting in the Llamas, whose toes are completely separated from each other; and on the

existence of one or more large fatty humps on the backs of the Camels, while the Llamas have the line of their backs perfectly straight, or at the utmost forming a slight protuberance above the shoulders. The first and the last of these differences are not, it is true, of primary importance; but the second is closely connected with the habits of the animals, rendering the one group peculiarly fitted for traversing the sandy deserts of its native land, and the other for mounting and descending the lofty precipices among which its abode is fixed. It may therefore be considered without hesitation sufficiently essential for the establishment of a generic distinction, where the laws of geographical distribution have drawn so broad a line of demarcation, confining the one group to the arid deserts of the East, and fixing the other on the ridges of the mountain chain that traverses the southern division of the Western Hemisphere. They deserve this distinction at least as well as the Hogs and the Pecaries, or as several other genera which have been admitted by common consent as distinguishing the animals of the Old World and of the New.

In general appearance the Llamas present a striking contrast to their eastern representatives. Their slender and well formed legs bear a much more equal proportion to the size and form of their body, which cannot be better compared than to that of the Common Stag. Their necks, although in stooping they descend into a deep concavity on the upper side, are more habitually maintained in an upright position, and support much smaller and more graceful heads. Their ears are long, pointed, and extremely moveable; their eyes large, prominent, and brilliant; and the whole expression of their physiognomy conveys a degree of intelligence and vivacity for which we should look in vain in the heavy,

stupid, indolent, and unexpressive features of the Camel or the Dromedary. Their motions too are infinitely more graceful, their manners more frank and confiding, and their tempers, generally speaking, more docile and familiar. Such at least is the case with those which have been long retained in a state of domestication: the wild ones are at first more shy and exhibit occasional symptoms of violence, but good treatment soon reduces them to an almost equal tameness with their fellows. This facility of domestication, according to the theory of M. F. Cuvier, is dependent on their propensity for associating in herds, which may undoubtedly constitute a principal reason for the fact; but even in such animals, and of the Ruminant Order, there is too much diversity in this respect to allow of our regarding the instinct of associations as the only cause of their familiarity with man.

Zoologists are by no means agreed with respect to the number of species of this group. The early travelers in America speak vaguely of the Llama, the Guanaco, the Paco or Alpaco, and the Vicugna, but without indicating any tangible differences between them, and frequently, it would seem, without considering them as distinct. Until within the last half century the great majority of naturalists, including Ray, Klein, Brisson, and Linnæus, concurred in reducing them to two species, the Llama or Guanaco, commonly used as a beast of burthen, and the Paco or Vicugna, cultivated for its flesh and its wool. Of this opinion was Buffon when he wrote the history of the Llama and the Paco; but the observation of living specimens of the Llama and the Vicugna, and the communications of the Abbé Béliard on the subject, induced him afterwards to admit the latter animal as a third species distinct from both the preceding. In this he was followed by Molina,

who, in his Natural History of Chili, separated also the Guanaco, and added a fifth species, the Hueque or Chilian Sheep of the older authors. Gmelin, Shaw, and almost every subsequent compiler, have adopted these five species without examination, giving to them such synonyms as they could pick up almost indiscriminately from the writers on the natural history of America, and thus creating a mass of confusion which it would be both vain and useless to attempt to unravel.

It seems to be the general opinion among the leading writers of the present day that this subdivision has been carried to too great an extent. M. F. Cuvier limits the number of species to three, the Llama and the Paco, figured in his work, and the Vicugna, a representation of which was given by Buffon in his sixth Supplementary Volume. In the rejection of Molina's species, the Guanaco and the Hueque, we think that he is fully justified by the imperfect accounts furnished by that writer, and by his confessed want of materials for completing the history of the animals of which he treats. In the present instance it does not appear that he was personally acquainted with the Peruvian species from which he professed to separate his own. We should indeed have little hesitation in proceeding still further; for we are strongly inclined to agree with Baron Cuvier in regarding the Paco as a mere variety of the Llama, with the wool more amply developed; and in considering the Vicugna as the only animal of the group that deserves to be specifically distinguished from the latter. Our reasons for adopting this opinion it is unnecessary to offer in detail on the present occasion. They are founded partly on the observation of numerous specimens, varying in colour through different shades of white, brown, and black, or a mixture of two of these shades, and having the long

woolly hairs developed in various degrees ; and partly on our knowledge of the great extent of modification to which the domesticated races of Ruminants are uniformly subject.

The first Llama that was seen in Europe was landed at Middleburg in 1558, and sent as a present to the Emperor. A rude figure of this animal, engraved at Nuremberg, was copied by Gesner in his work on Quadrupeds. Several individuals were brought to Spain during the sixteenth and seventeenth centuries ; but the first specimen that particularly engaged the attention of European zoologists was that figured by Buffon. It was not again seen in this quarter of the globe until about the commencement of the present century, when a pair, male and female, were sent from Santa Fé de Bogota to St. Domingo, and thence transmitted as a present to Josephine, then Madame Bonaparte, at Malmaison. These were represented in the Ménagerie du Museum by Maréchal, and illustrated by an excellent article from the pen of Baron Cuvier. Maréchal's figures are tolerably accurate, and much superior to any former representation, in the works of American travellers or elsewhere, with the exception of that of Frézier, of which we shall have occasion to speak hereafter.

The Brown Llama in the Society's Garden appears to be in all respects, except some trifling variations of colour, precisely similar to the specimens figured by Maréchal. As in them, the head, neck, and legs of the Society's animal are covered with much shorter hair than the rest of the body ; a thin short mane extends along the middle of the neck ; and the back and sides are thickly clothed with fine long woolly hairs, becoming smooth, silky, and even shining towards the tips. The general colour, as in the male of Mal-

maison, is a uniform bright brown; its under parts, and the inside of the limbs, are white; and its head and ears of a deep dusky gray. Its tail is rather short, raised a little from the body, curved downwards, and covered above with long woolly hairs. The legs are moderately thick; the upper lip very prominent and deeply divided; and the neck longer than the fore legs, and consequently bearing a very unusual proportion to the height of the animal. It is remarkably distinguished by its activity and upright bearing, and by the spirited expression of its physiognomy, which is not unmingled with an air of spiteful malice. In temper it is far from docile; it readily accepts of bread or biscuits from the hands of the visitors, but is equally ready to take offence at any supposed injury or insult, and to revenge itself by discharging its saliva upon the offending party. This is the usual expedient to which these animals have recourse when teased or irritated, and it is certainly by no means an agreeable salute, although the mucus thus discharged has none of those corrosive properties which Frézier and other writers have ascribed to it.

In their native state the Llamas inhabit the Cordilleras of the Andes, but principally in Peru and Chili. They are rare in Columbia and Paraguay, and seldom make their appearance on the eastern side of the chain. They associate together in herds of one or two hundred individuals, and subsist entirely, according to Frézier, on a peculiar kind of grass or reed called *ycho*, that covers the mountains on the sides of which they dwell. While they can procure green herbage they are never known to drink, and it may therefore be presumed that they have the power of secreting from their food sufficient liquid to satiate their thirst. They do not appear to be so insensible of cold as the *Vicognas*, which are

generally found at a much greater elevation, and have a much thicker, finer, and closer fleece. At the beginning of the winter, according to Molina, the Guanacos (which we believe to be only the wild Llamas) abandon the mountains on which they have passed the summer, and descend into the valleys. Here the Chilians hunt them with dogs, which, however, can catch only the younger and less active individuals. The old ones are so swift as scarcely to be run down by an excellent horse, thus offering a striking contrast to the extreme slowness of their motions when in captivity and loaded with heavy baggage. When chased they frequently turn upon their pursuers, neigh with all their might, and then set off again at full speed.

The individual in the Society's Garden was presented by Robert Barclay, Esq., and has been for more than two years an inhabitant of the Menagerie. Its death, which has lately occurred, was occasioned by a purely accidental cause.





THE WHITE LLAMA.

AUCHENIA GLAMA. Var.

THE differences between the animal before us and that figured at the head of the preceding article are at first sight so striking, that we were long inclined to consider them as indications of a specific distinction. But a more extended observation of the Llamas which have been of late years exhibited in various collections has convinced us of the fallacy of this opinion, and proved to us that there exist numerous intermediate varieties, forming a continued series of links between the animals in question. We now entertain but little doubt that the white individual figured above furnishes a favourable specimen of the domesticated breed, as the brown affords a remarkably fine example of the animal in its wild, or rather its half-reclaimed, condition. The larger size of the former, its greater muscularity of

limb, the increased length of its wool, and the quiet mildness of its disposition, may all be regarded as the natural and almost inevitable results of its domestic education; while the perfect flatness of its forehead, which forms a straight line with the muzzle, and contrasts so strongly with the bold curve of the same part in the brown variety, is equally indicative of a long subservience to human control. In proof of this it is scarcely necessary to refer to the still more remarkable modifications which other domesticated quadrupeds have undergone, and which have removed them to so great a distance from their originals as to render it impossible to determine their mutual relations to each other.

In its native state the Llama, or Guanaco as it is then termed, is almost uniformly brown; but in domestication it assumes a variety of colours, of which the most usual are black, brown, gray, and white. These colours are frequently mixed in various proportions, or spread in large patches over the body of the animal, which thus becomes mottled or piebald. The unmixed white appears to be the least common; insomuch that a White Llama was, according to Father Feuillée, the presiding deity of the natives of the province of Callao, prior to its annexation to the empire of the Incas. Incomparably the best figure that has yet been given of the Llama in its domesticated state is that which is contained in Frézier's *Voyage to the South Seas*, where the animal in front presents an admirable likeness of the white variety in the Society's Garden.

At the period of the arrival of the Spaniards in Peru, the Llamas were the only Ruminants known to the inhabitants, by whom they were employed as beasts of burthen, and were also killed in vast quantities for their flesh and for their fleece. Gregory de Bolivar estimates that in his time four millions were annually killed to be

eaten, and no less than three hundred thousand were employed in the transport of the produce of the mines of Potosi alone. The peculiar form of their feet renders them more safe than even mules in ascending and descending the mountain passes, and they consequently remain in use up to the present day for this particular service. But the excellent breed of horses introduced by the Spaniards, which has since multiplied so prodigiously in many parts of South America, has almost entirely superseded their use in the open country; and it is only in some remote districts, where the poverty of the inhabitants precludes them from keeping the more expensive animal, that they are still occasionally employed.

Their chief merit indeed, next to their security of footing, is their sobriety, and the trifling expense at which they may be maintained. "They want," says Father Feuillée, "neither bit nor bridle nor saddle; there is no need of oats to feed them; it is only necessary to unload them in the evening at the place where they are to rest for the night; they go abroad into the country to seek their own food; and in the morning they return to the same place, their baggage is replaced, and they continue their route." Their principal disadvantages are their comparative weakness, the slow rate at which they travel, and the obstinacy of their disposition. They are unable to carry more than from a hundred to a hundred and fifty pounds, at the rate of twelve or fifteen miles a-day; and if their load is too heavy, or the driver has recourse to blows to compel them to proceed faster, they lie down and pertinaciously refuse to proceed. It is customary on this account for each convoy to be followed by a number of spare Llamas, to one of which the load is immediately trans-

ferred, and the exhausted or obstinate beast is usually sacrificed upon the spot.

The flesh of the Llamas is considered savoury when young ; and their wool is in great request, especially among the native Indians, who make use of it in the manufacture of stuffs, ropes, bags, and hats. The skin was employed of old by the Peruvians to make soles for shoes ; but as they were ignorant of the art of tanning and currying, the shoes thus made were incapable of keeping out the wet. The Spaniards, however, turn it to better account, and convert it into very excellent leather, which is especially valued for the making of harness.

The specimen figured, the only one of the purely white variety that we have seen, was presented to the Society by the Duke of Bedford, and has been an inhabitant of the Menagerie ever since its formation.





THE PACA.

CÆLOGENUS SUBNIGER. F. CUV.

THE Paca, which the similarity of name must not lead the reader to confound with the variety or species of Llama called Paco, is one of the few Rodent animals that attain any considerable size, and are habitually made use of by man as articles of food. It has been frequently noticed by travellers in South America, who have sometimes compared it to a hare, and sometimes to a sucking-pig, animals which it must be confessed bear little resemblance to each other, and as little to that of which they have been made to serve as familiar illustrations. As a Rodent, however, the latter was usually arranged by the naturalists of the last two centuries either with the Rats or with the Hares, the two genera which served as the common receptacles of all the imperfectly known species of the Order. Even up

to the publication of the twelfth edition of his *Systema*, Linnæus continued to refer not only the animal in question, but along with it the Cavy and the Agouti, to his comprehensive genus *Mus*. Klein was the first to break through the trammels of antiquity, and to form of the three animals just named a new genus under the name of *Cavia*, which was adopted by Gmelin (who added to it the *Capybara*, erroneously associated by Linnæus with the Hogs), and this designation has been retained by most subsequent writers.

But although these animals are closely connected together by many characters of the highest importance, and especially by the total want of clavicles, each of them is nevertheless distinguished from the rest by such striking peculiarities as fully to warrant its separation as a distinct genus. If we look to the teeth, we see at once that those of the Paca and Agouti are wholly unlike those of the Cavy and *Capybara*, and proceeding further in the examination we perceive minor but characteristic differences in each of these subdivisions. In the feet and toes variations occur to a still greater extent; and equal differences are found in other organs, both external and internal. We are therefore constrained to acknowledge the justice of the subdivisions which this little family has undergone, although we cannot but regret the necessity of founding genera upon single species. There are now, however, recognised two distinct races of Paca, and three of Agouti; and it seems probable that further inquiry will make us acquainted with some additional species of each group.

The dentary formula of the Pacas exhibits two incisors in each jaw, followed by a vacant space on either side, behind which are ranged four molars of nearly equal size, having the lines of enamel which are visible on their crowns disposed in an irregular and compli-

cated manner. They present in the very young state a somewhat different appearance from that which they assume in the full-grown animal, when their surfaces are worn down below the level of the tubercles by which they were originally surmounted. Generally speaking, they are marked by one or more foldings-in of the enamel on the inner side of the tooth, and by two or three transverse grooves surrounded by enamel, and not extending to the margin. These grooves are for the most part the remains of folds or tubercles which existed in the young state, and have been gradually effaced by the continued detrition of the surface; they consequently become less numerous and less strongly marked as the animal advances in age.

Besides these peculiarities in their teeth, the Pacas are remarkable for having five toes to each of their feet, none of the other animals of the family having more than four on the fore feet and three on the hind. The thumb is, however, little more than rudimentary, and distinguishable merely by the presence of its claw. All the claws are broad, strong, and formed for digging in the earth. The Pacas are further distinguished by the total want of visible tail, there being only a slight prominence to mark the existence of that member; by the extreme shortness of their hairs, which are thinly spread and rigid to the touch; by their ears of moderate size, rounded at the tips, and forming several distinct folds; by their large open nostrils, occupying the extremity of a broad muzzle, which is separated into two portions by a vertical groove; and by the very great breadth of their faces. The last circumstance, which constitutes one of the most striking features of the group, is due to a singular conformation, the existence of which was first pointed out by M. Geoffroy-Saint-Hilaire, in a specimen which died in the Paris

Menagerie about five and twenty years ago. Daubenton had before remarked that the zygomatic arches of the Paca were very large, and descended more than usually low; and Buffon had noticed that "on each side and towards the lower part of the upper jaw there exists a sort of longitudinal fold, destitute of hair in the middle, so that at first sight it might be mistaken for the mouth of the animal." Had this distinguished zoologist proceeded further with his examination, he would have discovered that the fold of which he speaks forms the opening of a shut sac of considerable extent, passing upwards behind the arch formed by the union of the bones of the cheek and temple, the inner surface of this portion of those bones being lined by a continuation of the skin of the face, which is afterwards reflected upon the upper lip. No use has yet been assigned for this curious provision, but a somewhat analogous structure occurs in the Gauffres of North America, forming the genus *Diplostoma* of Rafinesque. It bears no analogy to the cheek-pouches of the Monkeys, for its opening is external to the mouth, which is moreover furnished with true cheek-pouches, capable of considerable dilatation, and occupying when filled the entire space beneath the zygomatic arches.

The Pacas are animals of a thick-set and clumsy form, measuring when full grown about two feet in length from the tip of the nose to the extremity of the body, and about one foot in height both before and behind; for although the hinder legs are considerably longer than the anterior, they are so bent as to allow a much greater proportion of their length to press upon the surface of the ground. Their eyes are large, prominent, and of a brownish hue; the tips of their noses broad and blackish; their ears nearly naked; and their whiskers long and rigid. We are indebted to M. Fré-

deric Cuvier for pointing out the distinctions between the two species, which consist principally in colour and in the form of their heads. In the brown, the general colour is dusky with a deeper shade on the back and a tinge of grayish white on the under parts; while in the other species it is of a bright golden fawn-colour on the back and sides. Both are marked by four or five longitudinal bands passing from the shoulders to the haunches, and formed of oblong whitish spots, sometimes running completely together, and sometimes entirely separate from each other. The lower ones have the greatest tendency to unite into continuous bands, and the last on either side is frequently blended with the white of the under surface of the body. There is in fact so much similarity in their markings that we should place but little confidence in the distinction founded on the difference of colour alone, were it not confirmed by more striking characters, derived from the examination of the skulls. The bones of the head are in the brown species perfectly smooth on their surface, and the zygomatic arches form a much less prominent sweep than in the fawn-coloured, in which the numerous projecting tubercles that cover the bones are distinctly perceptible through the unevenness of the skin.

These animals are found in the whole of the eastern division of South America from Surinam to Paraguay, and formerly existed in some of the islands of the West Indies. They take up their abode in the forests, especially in the vicinity of water, and conceal themselves in superficial burrows, which their claws are well fitted for excavating. They are said to form three openings to each burrow, and to cover them up with dry leaves and branches. In order to take them alive, the natives stop up two of these openings and dig up the third; but the animal frequently makes an obstinate defence,

and bites very severely. It swims and dives remarkably well, and although so heavy runs with considerable swiftness. Its cry resembles the grunting of a pig, and this circumstance, combined with the mode of its rooting in the earth with its nose, the bristliness of its hair, and the flavour of its flesh, probably gave rise to the comparisons made by the older travellers between the two animals. Its flesh is said to be very savoury, and forms a staple article of food in many parts of South America. It never quits its burrow except during the night, when it goes in search of its food, which consists chiefly of herbs and fruits. The sugar-cane plantations occasionally suffer much from its devastations.

In captivity it is quiet and contented, and the history which Buffon has given of one that lived for some time in his house proves that it may even become familiar. Our specimen lived for some months at the Garden, and died during the severe weather at the early part of the last winter.





THE LONG-NOSED AGOUTI.

DASYPROCTA AGUTI. ILLIG.

THE Agoutis and Pacas were first separated by M. F. Cuvier in the *Dictionnaire des Sciences Naturelles* in the year 1806; but by some oversight he then neglected to distinguish the former by a generic name. In 1811, Illiger supplied this deficiency by applying to them the term *Dasyprocta*, for which M. F. Cuvier has since endeavoured to substitute that of *Chloromys*. We are compelled, however, while we acknowledge that the genus was of his formation, to reject his name and adopt that of Illiger, which has the unquestionable advantage of priority. When a right of this description has been waved in the first instance, and subsequently exercised by another, it cannot be resumed by the original possessor without creating that confusion in nomenclature

which it is the interest of science to discountenance and as much as possible to prevent.

The generic characters of the Agoutis, as regards the teeth, are not very essentially different from those of the Pacas. The distinctions in fact depend chiefly on such minute points in the disposition of the lines of enamel as would be totally unintelligible without the aid of figures or specimens. In number, character, and general outline of form they are scarcely to be distinguished. On their fore feet the Agoutis have only four apparent toes, armed with strong claws, the two middle ones projecting forwards beyond the others, with an internal tubercle occupying the place of the thumb, but scarcely prominent beyond the surface. The number of toes on the hind feet is reduced to three, which are slightly connected by a membranous expansion at the base, and are furnished with still larger and more hoof-like claws than those of the anterior extremities. The head is more elongated, the forehead is flatter, and the face has much less breadth than in the Pacas. These animals are indeed altogether of a much lighter and more graceful make; their legs are thin and slender; their tails extremely short; their eyes large and rather prominent; their ears middle-sized and rounded; and their whole body covered with long, close-set, somewhat rigid hairs. Like the Pacas, they are all natives of America, and appear to be confined to the southern division of that continent.

The species which at present engages our attention, the Long-nose Cavy of Pennant and Agouti of Buffon, is about the size of the common rabbit, with which it has also some resemblance in form and habits. Its general colour is of a grizzled reddish brown, tinged with yellow on the neck, chest, and under parts, and

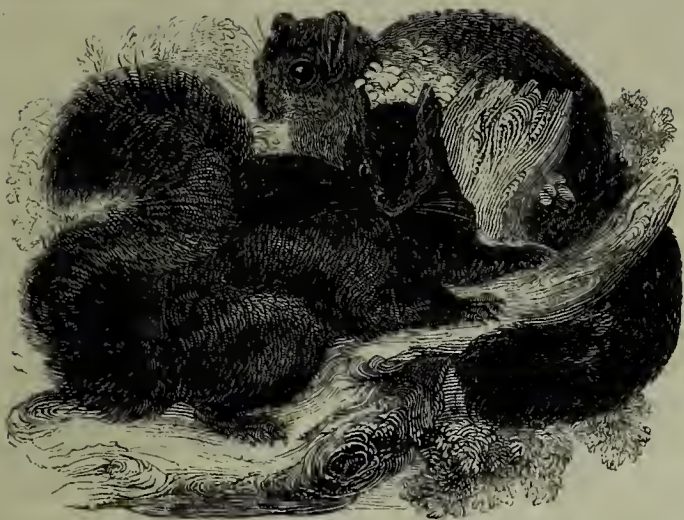
on the shoulders and haunches. The legs and feet are nearly black, and the claws of a dusky gray. The hair on the face and legs is extremely short; but it increases in length as it approaches the crupper, where it measures three or four inches, and has much of the rigidity of a hog's bristles. It is, however, perfectly smooth, and lies flat upon the surface of the body. The ears are short, rounded at their tips, naked, and rather flaccid; the line of profile is strongly curved, but not elevated so as to form a crest; the upper lip is deeply divided; and the lower jaw almost devoid of hair. The hinder limbs are considerably longer than the fore; but, as in the Pacas, they are brought nearly to an equality by the application in the former of a lengthened portion of the sole to the surface of the ground.

The Long-nosed Agouti is said formerly to have inhabited most of the West India Islands, but is now almost confined to St. Lucia. It is still, however, extremely abundant in Brazil and Guiana, and extends southward into Paraguay, where it was observed by D'Azara. According to the testimony of Laborde and Sonnini, it is the most common quadruped in Guiana, and forms one of the most usual articles of food both to the colonists and natives. To use the words of the former, "All the woods are full of it, whether upon the hills, on the plains, or in the marshes." It is said rarely to burrow in the earth, preferring for its habitation the hollow trunks of trees or such retreats as require but little exertion to fit them for its use. In running it is extremely swift, taking long leaps like those of the hare, which it also resembles in its timidity and in the fineness of its ear. Its food consists principally of roots and fruits; and of the latter those of several species of palms appear to be its particular favourites; but it is by no means fastidious in its diet,

and in captivity is readily brought to eat both fish and flesh. It always eats seated upon its haunches, conveying the food to its mouth by means of its fore-paws. The abundance in which it is met with proves that it is extremely prolific ; otherwise it must long ere this have been rendered scarce by the wholesale destruction to which it is exposed.

So readily do the Agoutis become habituated to a state of domestication, that we cannot but join with M. Sonnini in regretting that no attempts have hitherto been made to place them as completely under the control of man as the Rabbits, to which they bear so remarkable an analogy, not only in their manners, but even in the taste of their flesh, which is described as delicately white and of exquisite flavour. It is indeed surprising that the inhabitants of the countries in which they abound, who derive from them so large a portion of their subsistence, should never have been induced, by these considerations, to breed them for their tables, and thus to insure a constant supply, instead of trusting to the uncertain produce of the chase. They are said to be no less useful in another point of view, their skins being converted into very strong leather.





THE AMERICAN BLACK SQUIRREL.

SCIURUS NIGER. LINN.

FEW animals are subject to more extensive variations of colour than the Squirrels of the northern and temperate regions of the globe. In the higher latitudes of the Old World the common species assumes during the winter an entire coat of gray, and in this state furnishes one of our most common and useful furs. Farther eastwards, and especially in the neighbourhood of Lake Baikal and on the banks of the Lena, we are told by Pallas that these animals are found during the summer of a sooty brown, and in the winter of a leaden gray, with their tails black and shining. They are also not uncommonly met with in the same localities entirely or partially white; and even, according to J. G. Gmelin and other travellers, occasionally wholly black. Zimmerman informs us that the Museum at Brunswick

contains a specimen of this description taken in the woods of that duchy. Similar varieties appear to occur in the American races, and render the determination of species in this group extremely difficult.

Little doubt, however, can be entertained that the animal figured over leaf belongs to a truly distinct species. It differs from all the other American races by its small size, being little larger than the Common European Squirrel, and from the latter in wanting the pencils of long tufted hairs surmounting the ears. From the black variety of the large Hooded Squirrel it is further distinguished by being usually entirely black in every part, the nose and ears exhibiting only an occasional tinge of white, their invariable colour in that species. The tail too is comparatively shorter than in the Gray Squirrel, and the ears are almost naked. Catesby mentions that "some have their noses only white, others the end of their tail white, and some others have white round their necks." His own figure has a white nose, and a white collar surrounding the neck.

The Black Squirrel is said to inhabit Pennsylvania, the Carolinas, Florida, and Mexico. The first three of these habitats depend chiefly on the testimony of Kalm, Catesby, and Bartram, and the last on that of Hernandez, who may possibly refer to another species. Our specimens, which are extremely shy and wild, were brought from the United States, but we know not from what precise locality. In their native state they are highly destructive to the crops, and their flesh, according to Catesby, is very delicate; for both which reasons they are much sought after and destroyed without mercy.



THE WHITE-FRONTED LEMUR.

LEMUR ALBIFRONS. GEOFF.

THIS remarkable species was first indicated by M. Geoffroy-Saint-Hilaire in his excellent Memoir on the family Lemuridæ published in the Magasin Encyclopédique, and was soon after figured by Audebert, in his *Histoire Naturelle des Singes et des Makis*. The characters by which it is distinguished from the other species are principally those of colour. On its back and sides it is of a grizzled brown with somewhat of a rufous tinge, which is lost on the back of the head, where it becomes nearly black. The muzzle, which is prominent and lengthened, is entirely of a purplish black, as are also the hands. The most distinguishing feature of the species consists in a broad white band of woolly hairs spreading across the forehead, and including the ears and the sides of the face. The neck and inside of the fore limbs is white; the outside of all the limbs reddish brown; and the tail of the same colour with the back

for two-thirds of its length, but terminating in a black extremity.

In a subsequent paper, published in the *Annales du Muséum*, M. Geoffroy described as a distinct species, under the name of the Maki d'Anjouan, an animal distinguished from the last by having its forehead and the sides of its face of an iron-gray approaching to black, and its general colour somewhat lighter. But a male of the former and a female of the latter, confined in the Paris Menagerie, having produced young, M. F. Cuvier deduces from this fact a conclusive proof of their identity of origin, and asserts that these differences in colour are dependent upon sex alone. In contradiction to this opinion Mr. MacLeay some time since exhibited to the Linnean Society an animal regarded as a female, but having all the external characters supposed by the French zoologist to be peculiar to the male. There is, however, a possibility that some error may have occurred in the determination of the sex, for we have ourselves witnessed such a mistake; but be this as it may, the difficulty of discriminating between several of the closely approximating species of this group is by no means lessened by these observations. If the character derived from colour alone be, as the remark of M. F. Cuvier would lead us to suppose, variable and of uncertain value, we must abandon that which has hitherto been regarded as almost our only guide: and if on the other hand Mr. MacLeay's opinion be confirmed by future investigation, we shall be left in nearly the same state of indecision with respect to the Lemurs, as we find ourselves with regard to those groups, of domestic animals more especially, in which neighbouring species are known to produce together a mixed and intermediate breed, and in which the distinction of species has consequently become a hopeless task.



THE BLACK-FRONTED LEMUR.

LEMUR NIGRIFRONS. GEOFF.

DIFFICULT as it is to arrive at a satisfactory proof of the actual specific distinction of these animals, we feel convinced that that which is now before us possesses a just claim to be separated from the last. Our conviction is founded on the examination of numerous specimens, in none of which have we observed any essential modification of their distinguishing features. Their size, it is true, is nearly equal, and there is little, if any difference in their form; but their colours, invariable as we have hitherto found them, furnish sufficient ground for regarding them as distinct. The present animal has the elongated muzzle of the last; but the black colour embraces in it the forehead and sides of the face, as well as the base of the muzzle; and the hair on the former parts, instead of being long and woolly, is short,

smooth, and even. While the black is thus extended backwards over the head, it is bounded on the fore part of the muzzle, which instead of being uniform in colour, as in the preceding species, becomes grizzled towards its extremity, and at last almost white. The general colour of the upper parts of the body is a dark ashy gray, most of the hairs terminating in a tawny tip, which is so strongly marked on the back as to give it a decided tinge. The tail is light gray at the base, and darker towards the tip; the outside of the limbs is of a light ashy gray; the chin, throat, and chest, are pure white; and the under parts, together with the inside of the hind limbs, pale rufous. The hands, which are blackish, have the same tendency to become grizzled with the fore part of the muzzle.

This species, like the last, was first described by M. Geoffroy-Saint-Hilaire, who refers to it a figure given by Petiver under the name of *Simia-Sciurus*; but we cannot help thinking that the figure in question bears quite as near a resemblance to the White-fronted species. The Society's specimen of the latter is a male; both those of the Black-headed are, we believe, females. They are all perfectly tame and good-tempered, extremely agile, and entirely free from the petulance and grimace which characterizes the Old World Monkeys.





THE GREEN MONKEY.

CERCOPITHECUS SABÆUS. ERXL.

THE Green Monkey, although one of the most abundant of the long-tailed African group, which constitutes the genus *Cercopithecus* of modern writers, was first described, about the middle of the last century, by Brisson, from a skin in Reaumur's Museum. Edwards soon after figured a specimen from the island of St. Jago, in his splendid work on Birds; a second representation was given by Buffon in his History of Quadrupeds; a third by Pennant in his Synopsis; a fourth by M. Cuvier in the *Ménagerie du Muséum*; and a fifth by his brother in the *Histoire Naturelle des Mammifères*. Copies of these, and perhaps other original figures of the animal, have been given in various publications; but we must confess that we are by no means satisfied with any that we have seen. M. F. Cuvier has lately separated from the species two or three very closely allied races; how far they merit this distinction, it must be left for future observation to determine.

The colour of our animal is greenish yellow above, arising from the ringing of the hairs with various shades of yellow and black, but assumes more of a dark grizzled appearance on the sides of the body and outer sides of the limbs, which become gradually darker towards the hands. The face, ears, and naked part of the hands are of a jet black; the former is of a triangular shape, bounded above the eyes by a straight line of stiff black hairs, and on the sides by spreading tufts of light hairs with a yellowish tinge, meeting in a point beneath the chin. The neck and chest are white, the under parts of the body have a yellowish tinge, and the inside of the limbs is gray. The length of the head and body is sixteen or eighteen inches, and that of the tail somewhat more.

Adanson has given, in his *Travels in Senegal*, an amusing account of the manners of these animals in their native state. In captivity they are generally capacious and malicious; but much of their character, as in the other species, depends on their age and education.



SYSTEMATIC INDEX.

(ARRANGED ACCORDING TO THE RÈGNE ANIMAL OF M. CUVIER.)

Class. MAMMALIA.

Order. QUADRUMANA.

Simiæ.

	Page
Cercopithecus Mona, <i>Geoff.</i>	37
Diana, <i>Geoff.</i>	33
ruber, <i>Geoff.</i>	135
Petaurista, <i>Geoff.</i>	137
Sabæus, <i>Erxl.</i>	303
Cercocebus fuliginosus, <i>Geoff.</i>	77
Æthiops, <i>Geoff.</i>	79
Semnopithecus Entellus, <i>F. Cuv.</i>	81
Macacus Silenus, <i>Lacép.</i>	21
Sylvanus, <i>Lacép.</i>	191
niger	189

Lemures.

Lemur ruber, <i>Péron</i>	145
albifrons, <i>Geoff.</i>	299
nigrifrons, <i>Geoff.</i>	301
Loris tardigradus, <i>Geoff.</i>	139

Order. CARNIVORA.

PLANTIGRADA.

Ursi.

	Page
Ursus Arctos, <i>Linn.</i>	99
Americanus, <i>Pall.</i>	107
maritimus, <i>Ersl.</i>	129
Ratelus mellivorus	13

DIGITIGRADA.

Mustelæ.

Mustela flavigula, <i>Bodd.</i>	225
Martes, <i>Briss.</i>	229

Canes.

Canis familiaris. var. Pomeranus	257
lagopus	25
borealis	27
Anstraliasiæ	51
Cubanus	111
Molossus (Thibetanus)	149
Vulpes, <i>Linn.</i>	211
fulvus, <i>Desm.</i>	217
var. decussatus	221
argentatus	223

Feles.

Felis Leopardus, <i>Linn.</i>	87
Onça, <i>Linn.</i>	95

MARSUPIATA.

	Page
<i>Didelphis Virginiana</i> , <i>Cuv.</i>	265
<i>cancrivora</i> , <i>Cuv.</i>	271
<i>Petaurus sciureus</i> , <i>Geoff.</i>	71

Order. RODENTIA.

Sciuri.

<i>Sciurus maximus</i> , <i>Gmel.</i>	179
<i>cinereus</i> , <i>Linn.</i>	183
<i>niger</i> , <i>Linn.</i>	297
<i>Palmarum</i> , <i>Linn.</i> var.	47
<i>Pteromys Volucella</i> , <i>Cuv.</i>	185

Mures.

<i>Mus Barbarus</i> , <i>Linn.</i>	29
--	----

Castores.

<i>Castor Fiber</i> , <i>Linn.</i>	153
--	-----

Hystrires.

<i>Hystrix cristata</i> , <i>Linn.</i>	171
<i>Atherura fasciculata</i> , <i>Cuv.</i>	175

Caviæ.

<i>Dasyprocta Aguti</i> , <i>Illig.</i>	293
<i>Cœlogenus subniger</i> , <i>F. Cuv.</i>	287

<i>Chinchilla lanigera</i>	1
--------------------------------------	---

Order. PACHYDERMATA.

Sues.

<i>Dicotyles torquatus</i> , <i>Cuv.</i>	55
<i>labiatus</i> , <i>Cuv.</i>	61

	Page
<i>Tapires.</i>	
Tapir Americanus, <i>Gmel.</i>	193
Order. RUMINANTIA.	
<i>Cameli.</i>	
Auchenia Glama, <i>Illig.</i>	273
var.	283
<i>Moschi.</i>	
Moschus Javanicus, <i>Raffles</i>	41
<i>Cervi.</i>	
Cervus Tarandus, <i>Linn.</i>	241
Virginianus, <i>Gmel.</i>	205
Axis, <i>Erxl.</i>	253
<i>Antilopes.</i>	
Antilope picta, <i>Pall.</i>	125
Cervicapra, <i>Pall.</i>	117
<i>Oves.</i>	
Ovis Aries, var. Parnassius	259
polycerata	263
<i>Boves.</i>	
Bos Americanus, <i>Gmel.</i>	113
Taurus, var. Indicus, major	65
minor	69

END OF VOL. 1.

